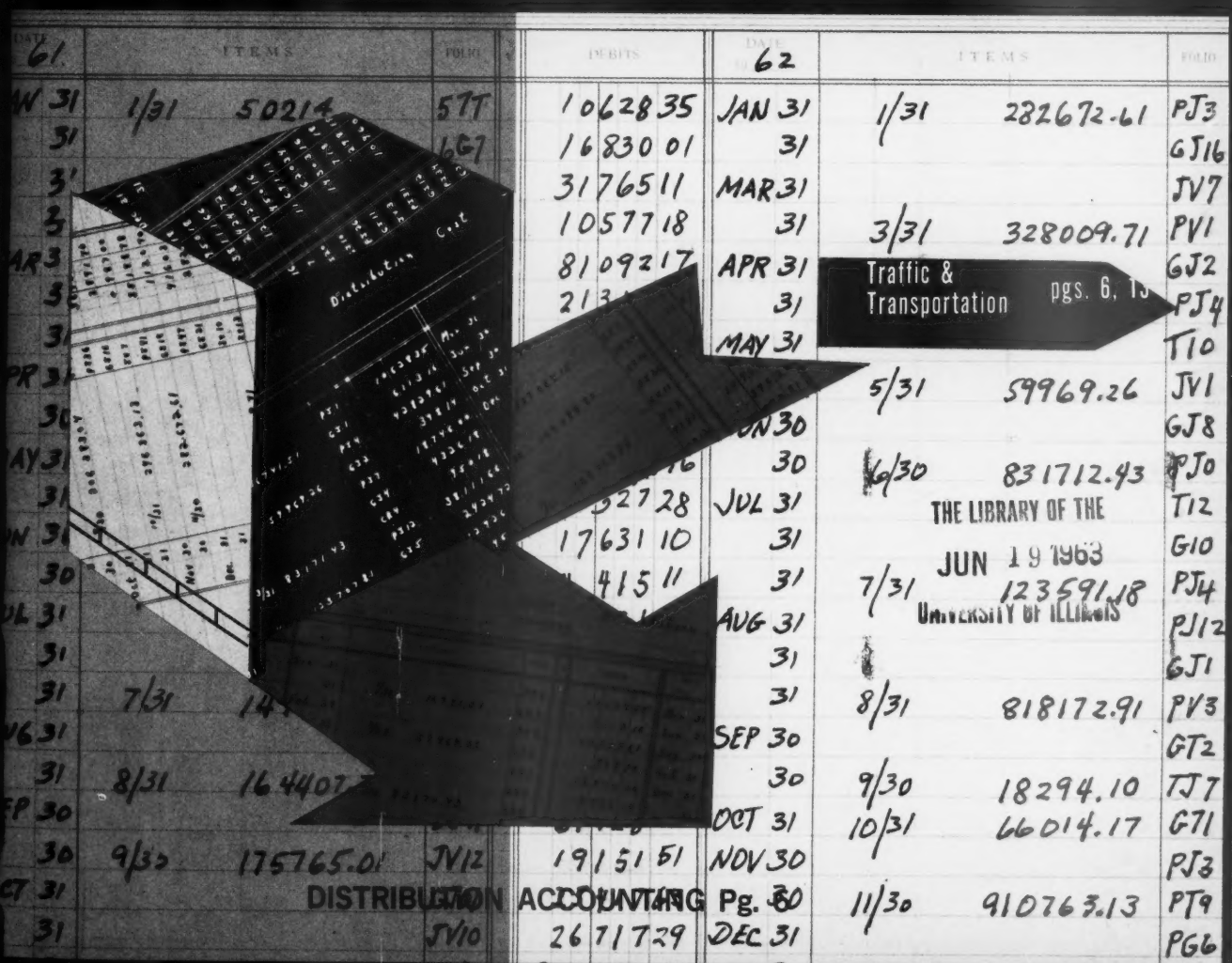
TDM

INVENTORY CONTROL • PRODUCTION PLANNING • MATERIAL HANDLING • TRANSPORTATION • WAREHOUSING • PACKAGING

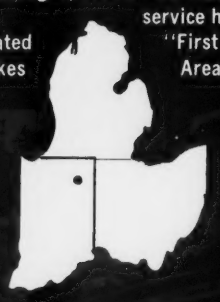


THE LIBRARY OF THE
JUN 19 1963
UNIVERSITY OF ILLINOIS

Associated serves Fort Wayne

Fort Wayne, one of over 900 points in the Great Lakes area served by Associated, has a long history as a transportation center because of its location at the meeting point of three rivers. Many important industries are concentrated near this Associated Terminal. ATL's 34 other terminals, over 2200 operating units and 1800 trained transportation experts afford Fort Wayne shippers dependable TL and LTL transportation to and from direct line service points at Chicago and throughout Michigan, Ohio and Indiana.

Outstanding service has made Associated "First in the Great Lakes Area!"



Memorial statue of General Anthony Wayne, founder of Fort Wayne, Indiana

TERMINALS: • ANN ARBOR • BATTLE CREEK • BAY CITY • BENTON HARBOR • CADILLAC • CHICAGO • CINCINNATI • CLEVELAND • COLUMBUS DAYTON • DETROIT • FLINT • FORT WAYNE • GRAND HAVEN • GRAND RAPIDS • HAMMOND • HOLLAND • INDIANAPOLIS • IONIA • JACKSON KALAMAZOO • LANSING • LIMA • LUDINGTON • MANISTEE • MUSKEGON NILES • PIQUA • PONTIAC • PORT HURON • SAGINAW • ST. JOSEPH SOUTH BEND • STURGIS • TOLEDO • WARSAW

associated truck lines, inc.

15 ANDRE STREET, S.E. • GRAND RAPIDS, MICHIGAN

contents VOL. 1 NO. 3

EDITORIAL 2
A reader's letter prompts discussion of the "systems approach"

DISTRIBUTION MANAGEMENT TIPS 3
Plant site selection by the small manufacturing company

WASHINGTON WIRE 4
For once, Official Washington proves it can keep a secret

ACCOUNTING FOR PHYSICAL DISTRIBUTION, by H. G. Miller 6
Traditional accounting methods often create illusory savings

WAREHOUSE ON WHEELS, by Dr. Edward W. Smykay 13
Steps to take when product demand can be forecast accurately

MAKING CONTACTS WITH THE 'RIGHT' GOVT. PEOPLE 16
New Commerce Dept. service even makes your appointments

INDUSTRY BRIEFS 18
Trade association reports, facsimile billing news, meeting dates

THE NEW UNIVERSAL COMMODITY LANGUAGE 19
System will facilitate distribution and marketing decisions

COSTS OF HANDLING & STORING NON-UNITIZED SHIPMENTS 21
New study relates costs of labor, space and handling systems

MONORAIL SYSTEMS SOLVES TRUCKLOADING PROBLEM 24
20′ bundles of steel channels loaded by one man

PACKAGING SWITCH 26
A demonstration that products don't always determine packages

PACKAGING/PACKING & SHIPPING ROOM IDEAS 28

HIGHLIGHTS OF THE EASTERN PACKAGING/HANDLING SHOW 31
4 pages of photographs of new products and systems

MATERIAL HANDLING IDEAS 37

Transportation & Distribution Management is published monthly by The Traffic Service Corporation, 815 Washington Bldg., Washington 5, D. C. Tel.: STerling 3-7325. Application to mail at controlled circulation rates is pending at Washington, D. C. President and Publisher: E. F. Hamm, Jr. Editor and Associate Publisher: Warren Blanding. Vice President and Director of Sales: Charles B. Clark (at 500 Summer St., Stamford, Conn.). Art Director: Jack B. Willis. Production: Eustace Durrett. Circulation Director: Richard P. Coleman.

© 1961, by The Traffic Service Corporation. No part may be reproduced without written permission. Controlled (free) circulation to qualified persons in industry engaged in, or responsible for, one or more functions of physical distribution. Subscription price to all others: $3.00 per annum.

Regional Offices: STAMFORD, CONN. (Advertising Headquarters) 500 Summer St., DAvis 4-4116 (N. Y. City phone CYpress 2-8276). CHICAGO, ILL. (Editorial and Advertising) 22 W. Madison St., FInancial 6-8922. ATLANTA, GA. (Advertising) 1430 W. Peachtree St., N.W., TRinity 6-5658. PALO ALTO, CALIF. (Advertising) 261 Hamilton Ave., DAvenport 6-2700. SAN MARINO, CALIF., (Editorial) Boothe Bldg., 475 Huntington Dr., SYcamore 9-4638. Address all editorial and subscription mail to 815 Washington Building, Washington 5, D. C.

Traffic & Transportation pgs. 6, 13

Purchasing pgs. 19, 21

Material Handling pgs. 21, 24

Packaging & Shipping Rm. pgs. 26, 31

Warehouse Management pgs. 21, 24

Sales-Distribution pgs. 6, 16

A systematic approach to the systems approach

IN the midst of our preoccupation with the organic nature of the non-manufacturing, non-sales activities which comprise the physical distribution function, we have been taken to task by a thoughtful reader who says:

> "I for one object to being told that I must change my thinking and my way of doing business to the systems approach. I so object because from where I sit this is little more than the efficient businesslike conduct that many a capable administrator in the business world has been using in the course of his decision making. It is not new, and offers little more than the different name."

While we are inclined to agree that some of the more widely-publicized aspects of physical distribution management are hardly earth-shattering in their newness, we have nevertheless seen all too many cases where a sales manager leases a warehouse without consulting Traffic, for instance, with costly results, or when Packaging and Material Handling are so many light years apart that coordination of package design and handling systems is completely non-existent.

Thoughtful men like our correspondent recognize that, in the nature of things, their specialties must mesh with other specialties before they can have any real meaning. They make it their business to learn as much about other specialties as is necessary to make the meshing process as efficient and frictionless as possible. The quality of their decision-making is improved because they are better equipped to gauge the effect of their decisions on other company operations.

As we (and our correspondent) have said, this is not new. But what has heightened interest in the systems approach it typifies has been the advent of new mathematical concepts and machines to utilize them in the hitherto practically impossible function of precise measurement of "impact" and "tradeoff" — two words dear to the hearts of physical distribution analysts with a penchant for operations research and linear programming. And, granted that the accomplishments of data processing equipment in this area are spectacular, it should still be remembered that an Oriental mathematician with an abacus is no slouch, either, and while the revolving drums, flashing lights and clattering keys are impressive they are no substitute for the minds of the men who manage the machine.

Fascination with data processing equipment tends to obscure the fact that it is a servant, not a master; and if a complex machine in a remote control center appears to manipulate the actions and destinies of men, as is sometimes the case, we prayerfully hope that the machine is being used solely to provide meaningful information on which an intelligent, compassionate — and systematic — human being can base decisions.

We seriously doubt that data processing by itself can always come up with the right answers, for the very reasons that two competent, skilled and seasoned managers can study a problem and arrive at opposite conclusions. Perhaps intuition plays a large part in right answers, although we doubt it, and it is certain that some of the more complex "brains" now in the R & D stage will be able to perform some of the more intuitive thought processes of human beings — and make the same mistakes.

Already in existence are remarkable random-access memory units which in some ways are not unlike the human mind. Skillful programming of input and evaluation of output make such machines extremely useful in inventory control, production planning, traffic routing and the whole order-processing cycle. But before such machines can do their job, there must be a clear understanding of the *system* they are to serve.

Thus, while our editorial emphasis on the systems approach is not intended to offend our readers, most of whom are at the management level and necessarily familiar with the systems approach, we do think there is merit in demonstrating by various means the interaction among the diverse elements of a physical distribution system, sometimes at a level that will seem both obvious and pedestrian.

If we appear to get repetitious on this point (and we apologize in advance!), our insistence that each member of the physical distribution team should know something about each other member's function will spring from a firm conviction that what is obvious to one person isn't necessarily obvious to another, and that having the right answers in the unspectacular duties of the day is the most important step in achieving the spectacular successes of physical distribution management.

DISTRIBUTION MANAGEMENT TIPS

Plant site selection by the small manufacturing company frequently suffers from insufficient preliminary planning, but can get badly bogged down if over-elaborate site selection procedures are adopted. These are among the conclusions of an extensive study of site selection procedures conducted by James H. Thompson, Professor of Economics and Director, Bureau of Business Research, West Virginia University, under a grant from the U. S. Small Business Administration.

Another possible pitfall, says Prof. Thompson, is the tendency to overrate subsidies or attractive existing buildings. Subsidies represent transient, short-run advantages in contrast to the long-run advantages of a location that is economically sound on such fundamental bases as transportation costs, labor force, water and power supply and the nature of the site itself. And on the subject of buildings, one consultant expresses the opinion that more plant location errors can be charged to the influence of attractive "brick and mortar" than to any other single cause.

Industrial districts and parks come in for a fair share of criticism, too, with the objection that they are too expensive, that space is limited, and that they represent a target for union organizers. Of the 38 site cases studied in Prof. Thompson's report, in only one was the location finally chosen in an industrial park. Oddly enough, while most consultants and professional area development people seem to favor the industrial parks, particularly for the small manufacturer, small manufacturers themselves seem to feel the parks are good "for somebody else."

A weighted rating scale can be used to advantage when there are certain key factors which a company considers most important in its particular operations and which must be compared from community to community. In such a case, weights totaling 100 points might be divided among the key factors as follows:

Factor	*Weight Assigned*
Labor	58
Transportation	16
Community	12
Taxes	7
Specific Site	7
Total	100

Each factor in the scale would then be broken down into weighted sub-factors; labor, for instance, might be comprised of 50% wage rates, 15% benefits and 35% other factors such as availability, unionization and the like. Transportation would be broken down into types and facilities, weighted according to the particular company's transportation uses and policies. Then, every community under study would be given a rating of from zero to 10 points on each of the major factors. These scores would be multiplied by the predetermined weights and the results totaled. Thus a theoretically "ideal" community would have a final score of 1000.

An advantage of this system is that a 10-point rating scale for all factors permits a certain uniformity in judging that might not be possible if labor in each community had to be rated from 1 to 58, for instance, or transportation from 1 to 16, as is the case in some evaluation systems. Another point in favor of this system is that management doesn't have to reveal to its investigating teams the relative weights assigned to each factor, thus removing a possible source of individual bias.

Word of warning: a weighted rating scale that works well for location of one plant for a firm will not necessarily be right for location of other plants in the future, for

(Continued on page 30)

Washington Wire

Germane

Executive: Mum's the word . . . or is it?

Secy. of Commerce Hodge's much-heralded recommendations to Pres. Kennedy on transportation problems were delivered to the White House in November with little fanfare and not so much as a ripple of reaction or comment from the President. Scholar-businessman Dr. Gayton E. Germane of Stanford University and U. S. Steel, who had been in charge of drawing up the final report, quietly packed up and left town when his report-writing duties were completed. At the Commerce Dept., nobody knew nuthin', a state of silence indicating that a few heads may have been knocked together when the draft of a Presidential message to Congress on the subject was leaked to the press by a White House aide and never heard of again. Meanwhile, there was some speculation that Clarence D. Martin, Jr., Under Secretary of Commerce for Transportation, may have spelled out the broad outlines of the new report in an address to a Spokane transportation group several weeks earlier. Mr. Martin set forth a 5-point program of "drastic action" to bolster common carriers: 1) Realistic tax and depreciation policies for all carriers; 2) Re-examination of rate policy; 3) Recognition that the government should pay the same transportation rates as private shippers; 4) Redefinition of, and setting new standards for, private and exempt carriers; and 5) Establishment of clear and definite policies regarding user charges for air, motor and water carriers. "We in the Commerce Department," he said, "have some definite ideas about the principles that should guide the development of our national transportation system." And the only question left unanswered was whether those principles — plus the 5 points — would turn up in Pres. Kennedy's proposals to Congress in 1962.

Martin

The Congress: Railroads find a friend

The sepulchral quiet on Capitol Hill which in recent months had heard numerous bitter attacks on the railroads both for their merger activities and their selective rate-cutting practices regained some balance when from nearby Philadelphia Rep. Van Zandt, himself a former railroad worker, delivered a sound tongue-lashing to the Federal Government for its excesses of control of the railroads and for its lack of policy changes to meet competitive circumstances vastly changed since the days when the railroads were the only practical means of transportation. Claiming that the railroads' technological development was impeded by having to operate a "1961 business under 1920 regulations," he referred with something less than indirection to the controversial S1197 when he predicted "an even more determined effort by railroad foes — led by Teamster boss James Hoffa — to cut the limited rate-making freedoms won in 1958."

Van Zandt

The ICC: A pattern for mergers?

With rail merger hearings relatively quiescent during November, ICC Commissioner William H. Tucker livened the situation with a speech in Boston which was interpreted by some observers (including the Wall Street Journal) as an indication that the ICC may in the future take a lead in planning and implementing rail mergers on a re-

Tucker

gional basis which it considers in the public interest. Carefully worded as it was, Mr. Tucker's speech presented some sizable problems of semantic interpretation, but these excerpts seem significant:

"With the tremendous recent increase of merger activity, it seems to be of vital importance to develop, at the very minimum, guidelines of Commission policy at the earliest stages of formulation of any proposal.

"It is important for the Commission to refine its procedures and to employ all of the available powers already granted by the Congress. A dynamic approach to transportation problems based upon the mandate of national Congressional policy is necessary.

"The Federal government must be prepared to provide the kind of moral suasion necessary to bring about mergers within a practicable pattern — perhaps national, perhaps regional."

Whether Commissioner Tucker's proposal does in fact represent a trend away from the Commission's non-intervention policy as defined by Chairman Everett Hutchinson (T & D M, October) will probably best be determined by the reaction of Congressional proponents of various bills to slow rail discontinuances and mergers.

Boyd

CAB: Time is of the essence

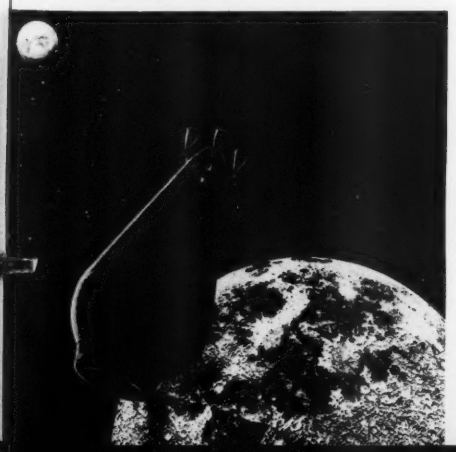
Chairman Alan S. Boyd of the Civil Aeronautics Board has little reluctance to go on record as favoring airline mergers as a solution to excessive air carrier competition and depressed earnings. Saying that U. S. trunk air carriers would be fortunate to earn "a niggardly profit" in 1961, and that even part of that would depend on capital gains from equipment sales, he asserted that upward pricing of air fares to cover deficits was "an exercise in futility and sure death, and not a merciful death at that." Operating economies, the sharing of facilities by airlines, route suspensions and transfers and mergers represent a much more fruitful area of solution, he feels, and mergers should be considered immediately. "Time may be running out for some carriers to receive what they and their investors consider to be a fair price for merging into other companies," he said. As if to bear out this statement, scarcely 2 weeks later Northeast Airlines, beleaguered by what was claimed by its traditional competitors, National and Eastern, to be a $3 million indebtedness to Shell Oil Company, presented to the CAB its plea for emergency relief of its dire financial situation. Emergency relief in this case would consist of the CAB's permitting Northeast to circumvent aviation law in seeking financial support from investors already controlling other segments of the air transport industry. Nobody mentioned his name, but nobody questioned the fact that Howard Hughes was ready to salvage the badly-buffeted airline. Eastern and National, however, felt little sentiment for the plight of Northeast. In bluntly-worded briefs, they stated the view that the impending collapse of Northeast was the result of gross mismanagement and that the CAB should permit the airline to expire. Mohawk Airlines, they stated, could take over Northeast's essential routes in the north, while they could handle the southern runs. Shell Oil, meantime, was said to have threatened to cease providing fuel to Northeast if a payment of $200,000 was not made immediately. As T & D M went to press, there was good reason to believe that the airline might finally run out of gas.

Transportation business: looking up

Truckloadings and rail carloadings continued their gradual climb to pre-recession figures during November, with trucks up 13.6 per cent and rails up 7.2 per cent. Piggyback loadings continued their sharp upward trend, 13 per cent over 1960 and 66 per cent over 1959. 59 railroads are now offering piggyback service, whereas 54 offered it a year ago and 50 in 1959. In the air, worldwide increases in cargo, mail and passenger traffic were reported for 1960, but IATA (International Air Transport Assn.) director general Sir William Hildreth said profits amounted to a "margin of one per cent," which he described as "precarious and ridiculous."

For certificated routes to the moon?

The planned vase-shaped logistics vehicle pictured here has been dubbed the 'Schmoo' by engineers of the Douglas Aircraft Co., Santa Monica, Calif. The company says the vehicle would be powered by a nuclear engine and that directional control would be achieved through four swivel nozzles at top. Crew and cargo compartments would be a doughtnut-shaped ring at the bottom of the vehicle, permitting easy loading and unloading at lunar and planetary bases. Vehicles shaped like huge cones, vases and flying saucers are among the designs Douglas engineers are considering to reduce the stresses of space flight on passengers in the 'next generation of vehicles.' Douglas engineers say that reusable low-cost nuclear-powered space transports can place man on neighboring planets by 1970, if a program for their development is pushed now.



Traditional accounting methods tend to hide true distribution costs, create illusory savings and relocate costs rather than reduce them, says this physical distribution authority in setting forth some basic principles for

Accounting for Physical Distribution

Physical distribution has emerged as an organizational and physical concept and, within a few years, has become a commonly accepted term in Traffic and Marketing circles. Definitions vary widely on what the term means and even on what the appropriate word should be. For the purposes of this article, I would like to use the definition, "Those functions involved in the physical movement of goods from the end of the manufacturer's production line into the buyer's point of use." The concept includes materials handling, packaging, storage and all transportation costs. It does not include selling or purchasing. It does cover both the inbound movement of raw materials and supplies and the outbound movement of products. This article will be directed primarily to physical distribution problems of basic industries selling to industrial markets rather than to the ultimate consumer. The basic concepts will apply to both industrial and consumer distribution, but the method of approach may differ.

The managerial functions and engineering skills involved in handling the various aspects of physical distribution have long been recognized by management and have been contributed to reduction of cost. The sudden interest in the new term covering the fields of material handling, packaging, traffic, transportation, inventory control, terminaling and warehousing was stimulated by the recognition that these functions were closely interrelated. While divided managerially and geographically, they regulate a unified flow of cargo from production point to consumer and a counter flow from raw material supplier to the production plant. Even more important in the stimulation of top management interest in physical distribution was the recognition it represented the third largest area of cost of doing business. It was also recognized that regardless of where the function was performed geographically or who on the company organization chart controlled the decision, the functions were closely interrelated in their impact on total costs. These functions, which bridge the geographical and time gap between the production line and the customer, are more closely related to each other than to the traditional cost control centers of production and sales.

To fully benefit long range from treatment of all physical distribution operations as a unified system, the organization must

by **H. G. MILLER**
Manager, Distribution Development
The Dow Chemical Company

be backed up by an accounting system that permits recognition, accumulation and control of these costs. Physical distribution must become an accounting concept as well as an organizational concept.

The creation of the physical distribution function as a management and accounting function will not automatically eliminate the gray areas between production and sales. Many decisions in the physical distribution area will have a direct bearing on both manufacturing and sales. The problem of inventory, discussed later, is an excellent example of the need for close coordination of the manufacturing, distribution and sales requirements to determine the most economic solution for the company.

In this article, I would like to review the major cost elements in the total cost approach to physical distribution and to note where these costs are normally found in the corporate accounts. I will illustrate how the traditional accounting methods fail to provide effective data for control. I will also note a few of the specific areas where the creation of an accounting entity for physical distribution may assist in the reduction of total costs and contribute to increased profits.

Total Physical Distribution Cost Analysis

Exhibit A is a summary of major physical distribution cost elements organized on the basis of where they occur in the movement of product from the end of the production line to the customer. I have also noted where you are likely to find these costs in traditional accounting records. No list of this type will cover all costs for all industries. The best method of determining these costs in specific studies is to actually follow the movement of product from the production point to customer and note and estimate the major costs which are incurred at each step. This method is particularly valuable when comparing the total cost of two alternate routes to supply a market.

The first area of costs are those which occur within the production plant and which are normally included in the cost of production. It has been customary to include in production cost, both single trip (i.e., expendable packages) and returnable containers (tank cars). Inclusion of tank car cost in a production account separates control over effective use of the equipment from the cost results. The number of tank cars required is a function of sales volume, location of the customers, carrier efficiency in moving equipment and most of all the average delays incurred in awaiting orders, storage at intermediate points and the delays in car unloading and release at the customer's plant. None of these variables are under the direct control of the production plant superintendent on whose accounts the resulting costs appear.

"To fully benefit long range from treatment of all physical distribution operations as a unified system, the organization must be backed up by an accounting system that permits recognition, accumulation and control of these costs. Physical distribution must become an accounting concept as well as an organizational concept."

The second major area of physical distribution cost is the transportation of product from the production plant to terminal or direct to customer and the further movement from terminal to customer. It is important to consider freight to return empty containers and related charges such as demurrage and insurance.

The third major area of physical distribution costs are those incurred as a result of storage of products in the plant or at terminal or redistribution points outside of the production plants. Many of the cost elements of the storage and warehousing function are the same when incurred outside the plant as when they are incurred inside the plant, although the

form of payment may be different. Too often, however, management tends to spotlight these costs when incurred outside the plant, while the same costs inside the plant gate are lost in production accounts.

One area of cost that often tends to be overlooked in distribution cost analysis is the financial cost of carrying inventories since, in most cases, no direct accounting charge is made for the cost of working capital. As noted, the same costs should be considered whether the inventory happens to be located inside the plant or outside.

The area of inventory control and establishment of inventory levels is one where there is divided responsibility between production, physical distribution and sales, and where careful analysis of the costs and benefits is essential to determine optimum levels.

For example, building an inventory may have several desirable results which must be weighed against the cost of miantaining the inventory:

(1) It may permit more economic production runs and smooth out seasonal swings. In this case, the cost of maintaining inventory must be compared with the benefits of lower production cost by production management.

(2) Larger inventories may permit more efficient movement of product to market. Savings in transportation cost must be weighed against the cost of maintaining the inventory by the distribution department.

(3) Inventory in the market permits faster delivery of product and often makes smaller volume deliveries economically feasible. The availability of inventory at the right place may result in increased sales. This must be carefully weighed by the Sales Department.

While there is a tendency to charge field inventories to sales and plant inventories to production, the location of the inventory may have little relation to the economic function it performs. Most inventories serve more than one of the above functions. For effective control, it is essential that all relevant costs and economic advantages be considered. This is an excellent example of an area in which recognition of the total physical distribution function as an accounting entity for cost accumulation will give more complete cost data. But it is still essential to weigh the benefits to production, distribution and to sales to arrive at the optimum inventory level and location. Operations research techniques may have a valid application to better weigh the complex variables to reach an optimum profit decision.

To complete the bridge of total physical distribution costs, I have noted those which are incurred by the customer. While this cost area fits nicely into our concept of smooth flow of product from the end of the supplier's production line to the start of the customer's process, there are obviously severe limitations to the ability of the supplier to control costs in this area. However, to ignore the customer's costs and to fail to recognize the impact of your actions on the customer can result in the highest distribution cost of all — "lost sales."

"MANY DECISIONS IN THE PHYSICAL DISTRIBUTION AREA WILL HAVE A DIRECT BEARING ON BOTH MANUFACTURING AND SALES."

In summary, one approach to detailed analysis of total physical distribution cost is to follow the physical flow of product from the end of the production line to the consumer. While the product may cross several lines of departmental responsibility, including the point of exchange from supplier's to customer's cost, the major costs tend to fall into five categories: materials handling, package cost, storage cost (space cost), financial cost of maintaining inventory and transportation cost. Recognition of the essential continuity and close interrelation of these functions can assist in the accumulation of more meaningful cost data and more effective control of the supplier's cost. It also provides a basis for objective analysis of the effect

of changes in these functions on customer's costs and the resulting impact on total sales.

How Physical Distribution Costs Are Handled In Standard Accounting Practice

It is difficult to generalize on the best or most common accounting methods for handling distribution costs. Perhaps an example of a problem we encountered in distribution of industrial chemicals may help illustrate the underlying problem.

A packaged product had been distributed by rail direct to a distant market. We determined by total cost analysis that a considerable reduction in physical distribution cost could be achieved by bulk barge movement of the product to a terminal centrally located in the market for packaging and distribution by truck and rail.

"TOO OFTEN MANAGEMENT TENDS TO SPOTLIGHT PHYSICAL DISTRIBUTION COSTS WHEN INCURRED OUTSIDE THE PLANT, WHILE THE SAME COSTS INSIDE THE PLANT GATE ARE LOST IN PRODUCTION ACCOUNTS."

Using the method of cost analysis outlined in Exhibit A, the two routes resulted in the cost summarized in Table I. The costs used are hypothetical, and I have simplified the presentation to focus attention on its impact on total cost and the accounting records.

In the illustration in Table I, total physical distribution cost is reduced by $.0065 per pound or by $130,000 per year on the anticipated volume. All of the saving resulted from a reduction in transportation cost by $1.10 hundredweight which reduction was partially offset by increased terminal cost, extra handling, administrative cost and the higher financial cost of maintaining the higher inventories required by water movement. No change occurred in the customer's cost as he continued to receive product in the same manner.

In Table II, I have summarized the effect of the change in distribution method on the various accounts involved. Where freight is netted against gross sales and is not shown as an expense item on the Profit and Loss Statement, the effect on the accounts is rather curious.

Plant production cost apparently decreases and the plant superintendent appears to be a hero if management looks at average cost only and doesn't recognize that the total reduction resulted from transfer of packaging to someone else's account.

The second major effect on the accounts is an apparent increase in net sales dollars as a result of the reduction in freight which is deducted from gross sales to get net sales. The accounting practice in some industries of treating freight as a reduction of sales dollars rather than a cost item on the profit and loss statement, has hidden this area from the attention of top management.

Outside warehousing and storage cost is substantially increased. Much of this cost was transferred directly from the production account when packaging was transferred from the plant to the terminal. However, if you were a marketing manager and charged with the cost of all out of plant stocks, you would be faced with explanation of a major increase in your costs while the offsetting reductions are occurring in areas outside of your cost responsibility.

This illustrates several problem areas in the accumulation of physical distribution costs by the accounting department in a manner that facilitates effective control by management. The following are a few of the major ones:

A. Freight The Lost Cost

The illustration clearly indicates the problems in cost control which result when expenses of manufacturing and selling are increased to reduce freight if freight is netted against sales and does not appear on the accounting reports. Even where freight is treated as an expense, it may be difficult to relate specific changes in distribution methods to cost results unless a breakdown by product is available from accounting.

TABLE I

COMPARISON OF DIRECT RAIL AND BARGE RAIL-DELIVERY

	Cost Per Cwt. Rail Direct	Barge-Rail
Production Plant Cost		
Packaging	$1.00	$ .00
Storage and Handling	.30	.10
Financial Costs Inventory	.10	.25
Administrative	.15	.05
Sub Total	$1.55	$ .40
Transportation Cost		
To Customer	1.60	.20
To Terminal	—	.30
Sub Total	$1.60	$ .50
Terminal Expense		
Packaging	.00	1.00
Storage and Handling	.00	.30
Financial Costs Inventory	.00	.15
Administrative	.00	.15
Sub Total	$ .00	$1.60
Total Cost Per Cwt.	$3.15	$2.50
Total Cost 20,000,000#/Year	$630,000	$500,000

TABLE II

CHANGE IN ACCOUNTS RESULTING FROM CHANGE IN DISTRIBUTION METHOD

	Cost Per Cwt. Direct Rail	Barge-Rail
Production Costs — (Plant)		
All Costs Except Physical Distribution	$10.00	$10.00
Physical Distribution	1.55	.40
Total Production Cost	$11.55	$10.40
Accounting Effect — Apparent Reduction In Plant Production Cost.		
Transportation Cost		
Gross Sales Price	$15.00	$15.00
Net Freight Cost	1.60	.50
Net Sales	$13.40	$14.50
Accounting Effect — Net Sales Dollars — Increas		
Warehousing and Storage — (Field)	$ .00	$ 1.60
Accounting Effect — Field Warehousing Cost Substantially Increased.		

EXHIBIT A

PHYSICAL DISTRIBUTION COST CATEGORIES - INDUSTRIAL MARKETING

SUMMARY BY POINT OF OCCURRENCE

I. COSTS AT PRODUCTION POINT

(Normally included in production cost by accounting.)

A. Packaging
1. Package cost
2. Material handling and filling costs

B. Storage and Handling Costs
1. Labor and material handling equipment
2. Space cost — rental or amortization, maintenance and taxes on facilities

C. Financial Costs On Finished Goods Inventories
1. Cost of working capital
2. Taxes and insurance on inventories
3. Loss from deterioration or obsolescence

D. Administrative
1. Order processing and inventory control
2. Supervision of physical distribution functions
3. Communications and travel

II. COST OF MOVING MATERIALS TO CUSTOMERS

(Normally included in Freight on Sales or netted against gross sales.)

A. Freight — From Plant to Terminal or Customer and From Terminal to Customer
1. Freight payments or private carriage cost.

B. Transportation Equipment Cost
1. Net rental or ownership cost of transportation equipment furnished by shipper.

C. Product Loss Not Recovered From Insurance Or Carriers

D. Miscellaneous Costs
1. Insurance, demurrage, tolls and other charges

III. COST OF OUTSIDE STORAGE AND WAREHOUSING

(May be included in Cost of Goods Sold, Selling Expense or Distribution Account)

A. Packaging Expense

B. Storage and Handling Costs

C. Financial Costs of Finished Goods Inventories (Same as Item IC)

D. Administrative

E. Premium Freight Incurred as Result of Improper Location of Stocks

IV. CUSTOMER'S COSTS

A. Transportation Cost Absorbed by Customer

B. Storage and Handling Costs to Receive Material

C. Financial Costs on Raw Materials Inventories (Same as Item IC)

D. Rental or Demurrage Charges on Carrier or Supplier Furnished Returnable Containers.

B. Loss Of Meaning Through Averaging

Another limitation of accounting figures in distribution cost analysis is the presentation of these costs as averages which may represent a wide range of costs. For example, on a product sold at a uniform delivered price throughout the United States, the average freight cost is $.01 per pound and normal gross profit is $.03 per pound. Further analysis indicates actual freight ranges from $.002 to $.045 per pound. While overall marketing is profitable, there are certain areas which are marginal or unprofitable markets. The vast number of transactions involved in physical distribution makes it necessary to use some arbitrary averages or indices to allocate costs.

C. Separation of Supervisor's Responsibility For Cost Causing Decisions and Actual Cost Allocation on Accounting Records

We have noted that the product in physical distribution crosses many lines of management responsibility. Often the control of decisions affecting distribution cost is separated from the accounting responsibility for the resulting cost. Too often this separation of decision and cost result makes it difficult to determine the actual cost of the decision and results in a lack of effective control. This can easily result in programs which relocate costs rather than reduce them. Four specific examples may illustrate the popular corporate pastime of *relocating* rather than reducing costs.

(1) A new flexible, reuseable container is advocated by the production plant because it reduces packaging and plant handling cost. However, the turnaround time on the container is much slower than anticipated and return freight costs are high. These combine to offset much of the saving in production and packaging cost.

(2) Jumbo tank cars have received favorable rate attention by the railroads, but no adjustment has been made in mileage allowance to compensate for the higher rental cost. Much of the rate reduction is offset by increased equipment cost for the supplier. On products sold freight equalized or f.o.b. production plant the saving passed on to the customer may be substantially greater than the total reduction in distribution cost.

"TO IGNORE THE CUSTOMER'S COSTS AND TO FAIL TO RECOGNIZE THE IMPACT OF YOUR ACTIONS ON THE CUSTOMER CAN RESULT IN THE HIGHEST DISTRIBUTION COST OF ALL — LOST SALES."

(3) A distribution study indicates a substantial saving in shipping a customer 40,000 pound cars direct from the plant rather than truckloads from a nearby terminal. The shift is made, but within six months the account is lost to a nearby producer who offers better service.

(4) Marketing psychology changes package dimensions to increase attractiveness of the package. The change in size results in a 5 per cent increase in cube and changes the product's freight classification, substantially increasing freight cost.

Advantage of Assignment of Physical Distribution Costs to Common Accounts

While there are limits to the degree which the accounting department can adapt their financial and cost accounting systems to permit more effective control of these vital cost areas, some modifications may pay big dividends. The degree of detail which can be afforded and the control centers which are significant will differ with each company but the following guides may be applied generally:

(1) Where freight is absorbed by the manufacturer, an accumulation of freight cost by product is important.

(2) Accumulate costs in the accounts charged to the management groups making the decisions which can materially affect them.

(3) Because many of the costs in the physical distribution area are closely interrelated, the grouping of all these costs in related accounts can materially aid in effective control.

One key point where the grouping of physical distribution costs in a group of related accounts can pay big dividends is in the application of this data in the pricing structure.

Physical Distribution Costs and Pricing

Physical distribution management should determine the total cost differences which are a result of different methods of distribution or types of package and order size. As outlined in Heckert's basic work in this field, "*Analysis and Control of Distribution Cost*," these cost differentials should be carefully analyzed periodically to determine that price differentials represent actual cost differentials. It is through the establishment of proper price differentials that a supplier's costs are reflected in the customer's choice of distribution channels, packages and minimums. Industry tends to lag in reflecting changes in distribution methods and increases in physical distribution cost in these price differentials based upon minimums, package and shipping method. For example, many volume prices are based on 20,000 pound truckload minimums while the effective minimum for traffic and rate purposes has increased to 30,000 or 40,000 pounds.

The customer will buy that combination of package and minimum which is most economical to him. Therefore, unless the supplier places realistic differentials between the alternate methods of supply he offers, he will be subsidizing inefficient methods of shipment.

". . . THE POPULAR CORPORATE PASTIME OF RELOCATING RATHER THAN REDUCING COSTS."

It must be recognized, however, that a company's ability to set these price differentials is limited by competitive practice in the industry. Mass distribution of commodities requires competitive participation in mass markets. Obviously, it would be difficult to maintain a price differential between packages or based on minimums significantly different from those offered by competition if you wish to remain competitive in the market. A supplier cannot ignore the fourth area of physical distribution cost listed in Exhibit A. The customer will base his decision to purchase on evaluation of cost from his side of the bridge. To sell, the supplier must be competitive as measured by the customer's total cost.

"THE DIVISION OF RESPONSIBILITY . . . HAS CONTRIBUTED TO GENERAL MANAGEMENT MYOPIA IN THIS CRITICAL AREA."

The past five years have seen tremendous changes in the philosophy of rate making, and many innovations in transportation and packaging equipment have occurred. In our industry, jumbo tank cars, compartment tank trucks, rubber tanks and containers are a few of these innovations. Too often only a partial evaluation is made of the impact of these new methods on total physical distribution cost and reflected in the vital area of pricing. The division of responsibility for the elements of physical distribution cost and the loss of these cost details in most accounting systems has contributed to general management myopia in this critical area.

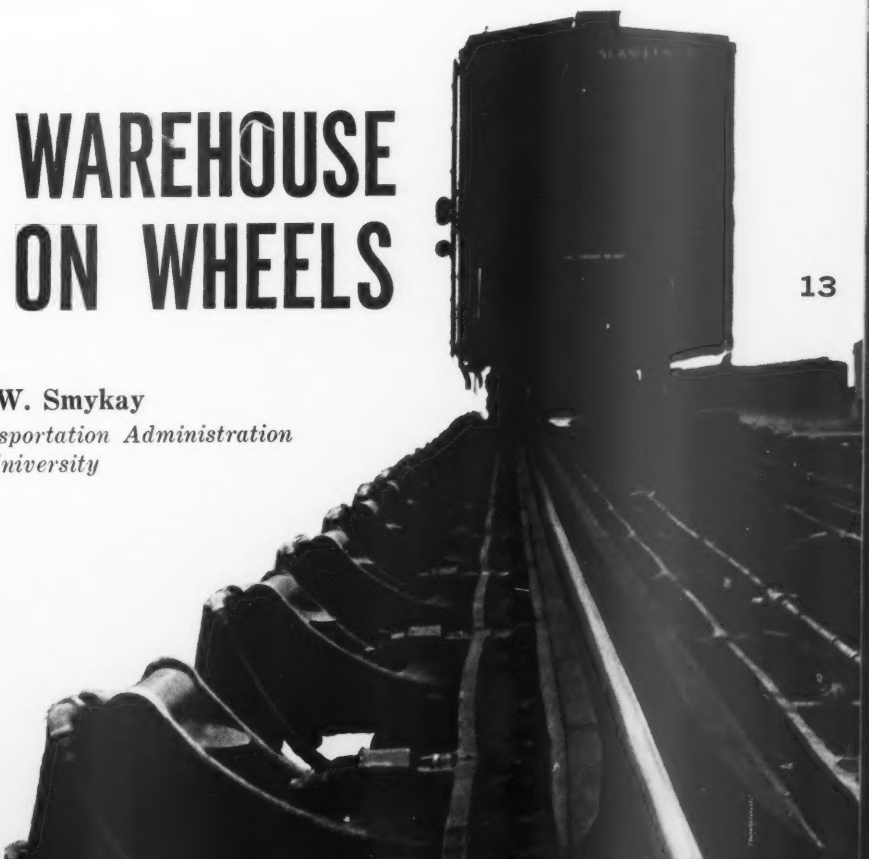
Summary

The concept of physical distribution involves viewing the closely related functions of materials handling, packaging, warehousing, inventory control and transportation as a management and total cost entity which has a significant bearing on production cost and marketing effectiveness. The concept does not eliminate the need for creative action in each of these areas; in fact, all cost reductions must be made by reducing these basic cost elements. Effective physical distribution cost control can permit more effective action in each of these areas by eliminating programs which reallocate rather than reduce cost. It can also provide marketing management with more effective tools for establishing price differentials based on package, method of shipment and order size.

If demand for your product can be forecast accurately, it may be time to consider the advantage of a

WAREHOUSE ON WHEELS

by **Dr. Edward W. Smykay**
Department of Marketing & Transportation Administration
Michigan State University



One of the most important decisions that must be made in marketing is the selection of a distribution method most suitable to reach a given market. Final choice rests on balancing cost and service requirements. This decision is actually a compromise: achieving reasonable cost control for profit-and-loss purposes and at the same time providing acceptable service standards to assure customer satisfaction. Only through highly coordinated sales effort and transport programming can a happy balance of these two coordinatives be achieved.

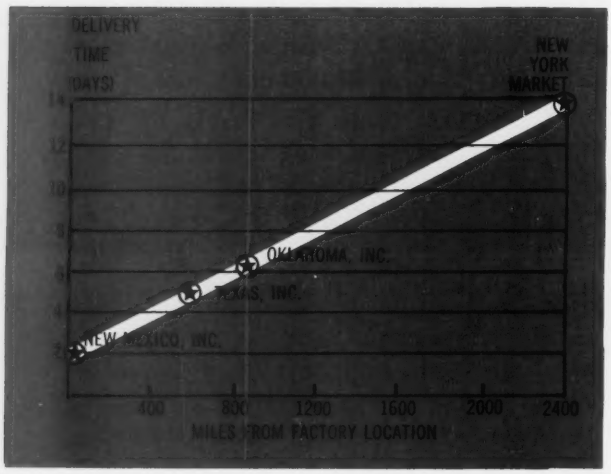
Through effective transportation management, sales effort becomes more fruitful in achieving goals of the total marketing strategy which a company employs. The unique skill of the traffic manager often provides information and ideas necessary to solve otherwise difficult problems. This article presents one ingenious approach to a distribution problem by use of these skills.

The Problem

New Mexico, Incorporated, a large, single plant producer of basic chemicals, is located in the southwestern part of the United States with sales offices in several major cities. It ships its product by rail to diverse parts of the country. New Mexico, Incorporated, is presently competing in the New York market segment with Texas, Incorporated, and Oklahoma, Incorporated, producers of comparable chemicals.

At a recent meeting of marketing and transportation personnel, it was disclosed that the sales department had established through feedback that customers frequently were able to procure shipments from competing companies three or four

days before they could from New Mexico, Incorporated. As a result, some established customers were no longer placing orders with New Mexico, Incorporated, and prospective customers were being lost due to poor delivery time. The traffic manager explained that the service advantage which the competitors enjoyed was purely one of closer proximity to the New York Market, as shown in Graph I.



I — Graph shows time-and-distance advantage of New Mexico, Incorporated's competitors in serving the New York market.

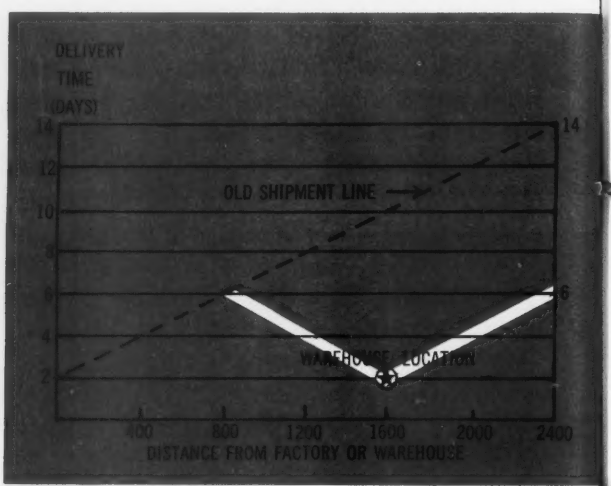
Alternatives

During the discussion which followed, it was disclosed that New Mexico, Incorporated, had been providing other customer services to somewhat counteract their transport time disadvantage, thus creating additional costs to the company. It was suggested that the traffic manager determine and study the alternatives to arrive at a solution to the problem.

Subsequently, the traffic manager determined three possible alternative solutions. These were: (1) drop this segment of the market because of its higher costs and poorer service and concentrate only on markets closer to the company, (2) use warehouse facilities close to the New York market, (3) attempt to estimate sales and use freight cars rolling toward the market as warehouses. Each alternative can be examined in turn.

The first alternative should be resorted to only if the others fail to provide a solution, and it proves unprofitable to operate in this market segment under existing conditions of competition.

The second alternative can be employed to solve the problem in the short run. As Graph II shows, placement of a warehouse at a distance of 1600 miles from the factory would permit a maximum delivery time of six days to any customer located between the plant and at a point 2400 miles away.



II — Placement of a warehouse 1600 miles from plant cuts delivery time but increases warehousing and inventory costs, offers company temporary advantage only.

By providing a warehouse, the company can derive a substantial service advantage over its competitors. The increased service would be an inducement for the return of old customers, and an attraction for new customers.

This move, however, would prove to be merely a temporary answer to their dis-

Traditional views on using transportation facilities for warehousing usually involve delaying shipping schedules and lengthening the distribution "pipeline" or using free time to its maximum to delay transfer of loading to an actual warehouse. Under the system described here, the object is the exact opposite. Under the proper conditions, shipping schedules can be speeded up and delays in the distribution pipeline minimized.

tribution problem, and would incur additional costs of warehousing and maintaining inventory. The Texas and Oklahoma companies could counter with warehouses of their own. Their selection of warehouse location might again provide shorter delivery time than New Mexico, Inc. The net effect might very well be an expensive undertaking with little or no ultimate market advantage resulting.

The third alternative can only be considered in the light of demand stability. New Mexico, Inc., has recently made a study in which it determined that, for the past two years, the New York segment of the market has required a very constant demand of two carloads per day. On the basis of this data, it is possible to ship carloads in anticipation of orders to be made in the near future. Thus if the traffic manager knows that two days are necessary for order processing, loading, and unloading, and he also knows that twelve days are required for transportation time to the New York market, a schedule such as the following can be designed. Shipments would be made fourteen days prior to the orders actually being taken.

SHIPMENT LEAVES NEW MEXICO INC.			TRANSPORT TIME ORDER-PROC. TIME LD.-UNLD. TIME	DEMAND OCCURS IN NEW YORK		
Wed.,	June	1 — 2 carloads	14 days	Wed.,	June	15 — 2 carloads
Thurs.		2 — 2 carloads	14 days	Thurs.		16 — 2 carloads
Fri.		3 — 2 carloads	14 days	Fri.		17 — 2 carloads
Sat.		4 — 2 carloads	14 days	Sat.		18 — 2 carloads
Sun.		5 — 2 carloads	14 days	Sun.		19 — 2 carloads

III — Warehouse-on-wheel system works well when demand can be forecast accurately and sufficiently in advance to plan transportation requirements.

The advantages of this system are as follows: (1) The sales department of New Mexico, Inc., is able to offer customers delivery on the day that the sale is made. (2) The customer needs only one day's inventory on any operating day and therefore cuts his inventory as well as investment in inventory when compared with the warehouse system. (3) This customer service improvement is free of cost to New Mexico, Inc., as the moving railroad car is the company's only warehouse. (4) The competition would be unable to improve upon this service, as a one day delivery time is considered minimal even if suppliers are located in close proximity. (5) In terms of market strategy, this move gives the supplier an opportunity to develop his sales and gain patronage until competitors can shift their distribution method in line with the warehouse on wheels system.

Competitors cannot regain advantage

A warehouse on wheels system is an excellent way to improve customer service without incurring additional costs if the demand for the product at any given point in time can be determined with a substantial amount of accuracy.

If Texas, Inc., and Oklahoma, Inc., shift to the warehouse on wheels system, they cannot regain the competitive transit-time advantage that they enjoyed before New Mexico, Inc.'s, change in distribution methods; they will instead have to provide additional customer services (such as technical aid, financing inventory, extended credit time, etc.) to eventually regain their share of the market. The traffic manager for New Mexico, Inc., has contributed as much to the sales effort as his position permits. The sales department must hold the added share of market that improved physical distribution methods have enabled it to enjoy.

While the system described here seems quite simple, additional statistical and cost analyses were obviously needed to reach a decision. Two companies now have effected this delivery pattern on certain of their products shipped to certain of their markets. Results show dramatic improvement in sales due to customer service improvement. In addition to the transportation adjustment, certain other changes proved necessary in sales operations.

(This article is the result of the Research Group in Physical Distribution at Michigan State University. The actual project upon which this paper is based was worked on by Mr. Jack Randall and Mr. Ward Fredericks, research assistants in the group.)

ONE-STOP SERVICE WILL CUT RED TAPE

Finding answers and making contacts for businessmen visiting Washington will be function of new Commerce Dept. Service

Secy. of Commerce Hodges dedicates new Business Service Center, introduces its manager, J. Richard Queen (top), and business analyst Louis A. Traxel.

The Department of Commerce is set up to relieve you of the time-consuming chore of locating the right people in the right Government agencies and then setting up appointments with them. The new Business Service Center in the main Commerce building in Washington will determine from the nature of your business who the Government people are that you should talk to, will make the initial contact for you and will then make a firm appointment on your behalf.

This can be particularly useful to men in physical distribution because of the vast amount of technical research being done in this area by widely-scattered Government agencies.

Behind this red-tape-cutting development is the growing recognition that many businessmen don't avail themselves of useful Government services because of the difficulties and frustrations of dealing with the Government, particularly in the course of a short stay in Washington. Many of them leave town with their business unfinished, declaring bitterly that they will never do business with the Government again. The effects can be as serious, for instance, as the decline in overseas dollar balances, a situation that Secy. of Commerce Hodges has been striving to overcome through a vigorous program of information, encouragement and assistance to businessmen who want to get into the export field.

As Secy. Hodges said in announcing the new service, "The Government is so big that visiting businessmen seeking information on business problems are likely to be at a total loss in locating desired sources. Our staff will be at his service, answering his queries on the spot or in other Federal departments. We expect to speed up the businessman's contacts with his government and to save him lost motion which can be put to more productive use in behalf of economic growth."

The Business Service Center is under the direction of J. Richard Queen, manager, assisted by Louis A. Traxel, business analyst, both men well-experienced in threading their way through the maze of Government operations.

Mr. Queen told T & D M that personnel of the Center are briefed frequently by Government departments and agencies, as well as by trade associations, the National Assn. of Manufacturers, the U. S. Chamber of Commerce, and technical representatives from industry to keep them abreast of the tremendous mass of technical and business information which develops almost daily. He described one of the Center's first "customers" as an out-of-town corporation which had channeled a request for assistance through its local Commerce Dept. field office and whose representative arrived in Washington to find half a dozen firm appointments with key Government personnel lined up for him.

Surprisingly enough, the new service has encountered very little opposition or jealousy from other Government agencies in Washington — many, seeing the opportunities to get useful public exposure of their services for businessmen, have in fact volunteered to deploy special staffs to the Center's office. Two of Washington's most baffling institutions — the Pentagon and the Atomic Energy Commission — have been most cooperative.

Of course, the Business Service Center is far more than an appointment bureau: it has a technical staff and publications library which, together, can answer a multitude of business questions; it has up-to-the-minute organization charts of Government agencies; and if it doesn't have the answer to a query, it can usually get on the track in short order. The Center serves the legislative and judicial branches of the Government, as well as embassies and other representatives of foreign governments as a referral center for business information. It has 400 foreign language specialists on tap for this purpose. Another task of the center is to coordinate and schedule out-of-town requests from high school and college classes for educational seminars at the Department of Commerce.

How to do business with the Business Service Center: If you're in Washington, dial WOrth 7-5201; that's the direct line to the Center, and the staff will take your problem from there. Or, better yet, go in person to the Center on the first floor of the main Commerce building, 14th St. N.W. between E St. and Constitution Ave. The staff is there; they have phones there for your use, and a coffee machine nearby. **Out of town:** contact your nearest Commerce Dept. field office, and let them forward your request for assistance to Washington. According to Mr. Queen, you'll be pleasantly surprised at the results.

INDUSTRY BRIEFS

APPRAISAL OF MATERIAL HANDLING INDUSTRY: "Investornews," monthly publication of stock brokerage firm Francis I. duPont & Co., gives detailed analysis of earnings and outlook of material handling industry, says that although profits are presently under pressure because of excess of used equipment and vigorous used equipment market, industry will benefit from increased emphasis on handling efficiency and development of overseas subsidiaries and licensing arrangements. Near-term outlook is healthy, publication says, and next year should be even better. (No. 212 Distribution Data Card). Most recent report from Material Handling Institute on material handling bookings confirms appraisal, shows new orders for September up 7½ points over August, and up 9½ points over September of 1960. Institute expects that 1961 will be at least 2 per cent above 1960, says that aggregate volume of business is now in excess of $1 billion annually.

STREAMLINED CONTAINER MANUFACTURING: New two-plant manufacturing facility in Los Angeles to be completed in early 1962 will integrate production of corrugated board sheets in first plant, owned by Crown Zellerbach Corp., with production of finished containers in second plant, owned by Fruit Growers Supply Co., purchasing affiliate of Sunkist Growers.

DIVERSIFICATION: Hyster Corp. has announced its entry into the platform trailer manufacturing field with introduction of two new models; heavy-duty model will handle 50,000 lb. load concentrated within 7', while standard model has 45,000-lb. capacity for load equally distributed. Heil Co. has new cargo and van container department in its plastic division, is designing and manufacturing a complete line of temperature-controlled, insulated and reinforced plastic containers for truck, train, air or water transport.

TREND TOWARD FACSIMILE BILLING: Two new methods have been introduced, Eastman Kodak's VIP (for Verifax Interline Procedure) and Clipper Carloading's Clipper-Fax. In the VIP system, carrier provides shipper with special 9-part combined bill of lading, a facsimile copy of which eventually returns to him as the freight bill, complete with extensions, carrier documentation and interline data. Principal advantage claimed is that all parties, shipper, carriers and consignee, utilize identical documentation based on shipper's original writing.

In Clipper system, shipper uses his own bill of lading, which is reproduced on left hand side of forwarder's bill, with extension of weights and rates performed by electric computer. Both systems save shipper from searching for original bill of lading to match up with bill, maintain identical language and commodity description throughout transport cycle. (For more information, circle No. 213 (Eastman) and No. 214 (Clipper) on Distribution Data Card.)

CENTRALIZED BILLING PROCEDURE: Also relying on facsimile process is new centralized billing procedure of Pittsburgh & Lake Erie RR which converts waybills to freight bills via masking process plus photocopying and diazo printers. Photostat Corp., whose equipment is used for copying phase, says centralized billing operation is ideal for highly concentrated line like P&LE, and that it has advantage over former local billing procedure (handled by local freight agents) of permitting mechanization of billing function, checking of charges by rate experts prior to billing, better auditing controls, and faster availability of both revenue and operating data. Railroad uses punch cards for its own accounting systems but mails photocopies of "converted" waybills as freight bills, and makes duplicate punch cards available for customers' edp systems if requested.

MEETING DATES ANNOUNCED: Material Handling Institute will hold 1962 early spring meeting at Hilton Inn, Atlanta, February 6, 7 and 8, is going south because of increased business there and also to "flee northern blizzards." National Wooden Pallet Manufacturers Association meets at Diplomat Hotel, Hollywood, Fla., from February 4 through February 7, will hear reports on "Buy from Pallet" system, which involves employment of unit load principle from raw material stage through to the consumer. Truck-Trailer Manufacturers Association will meet January 29-31 in Palm Springs, Calif., and July 15-18 at the Homestead, Hot Springs, Va.

Universal commodity language will facilitate marketing, distribution management decisions

New system developed by Bureau of Budget will permit rapid fact-gathering, analysis, and comparison of commodity flow with sales, production figures

A 6-digit code which will permit matching of transportation statistics with SIC (Standard Industrial Classification) figures for sales and production has been released in final draft form by the Bureau of the Budget in anticipation of the 1963 transportation census authorized by Congress. Adaptation of the 1,800-category code by the railroads to a 7-digit code covering the 20,000 items in the Uniform Freight Classification — a project now being worked on — will make possible detailed studies of costs and patterns of production, distribution and consumption.

Although the "Commodity Classification for Transportation Statistics," as the new coding system is known, holds considerable promise for carriers and for marketing and distribution men, a serious limitation at the present time is that the comparable railroad coding system has no counterpart among the motor carriers and freight forwarders who carry the bulk of small shipments.

Another apparent limitation is the railroads' claim that the new coding system will be used for freight statistics only, and not to supersede the existing Uniform Freight Classification as a basis for rate-making. If this is the case, a great deal of potential savings in paperwork and clerical time for industrial shippers will not be realized.

Outstanding feature of the coding systems is that they are adapted to use of data processing equipment which will permit recovery and comparison of data in sufficient time for meaningful management action — either to put out fires or to take advantage of marketing opportunities.

Many transportation men feel that a computer-based transportation pricing system is inevitable. They point to the time-consuming job of determining rates and auditing bills as being often all out of proportion to the value of the transportation service provided, particularly in the case of small shipments. They also point out that such a system would lend itself readily to rate analysis and revision by regulatory bodies, as well as to mechanical billing systems. It is certain that the increased use of data processing in other complex areas — such as inventory control — will lead to increased pressure for adoption of compatible transportation rate systems. The new commodity classifications should make the job easier.

For a cross-comparison of the Standard Industrial Classification, the Bureau of the Budget coding system and the railroad system, turn the page.

STANDARD INDUSTRIAL CLASSIFICATION

BLAST FURNACES, STEEL WORKS, AND ROLLING AND FINISHING MILLS

Group No.	Industry No.	
331	3312	**Blast furnaces (including coke ovens), steel works, and rolling mills.**

Establishments primarily engaged in manufacturing hot metal, pig iron, silvery pig iron, and ferroalloys from iron ore and iron and steel scrap; converting pig iron, scrap iron and scrap steel into steel; and in hot rolling iron and steel into basic shapes such as plates, sheets, strips, rods, bars, and tubing. Merchant blast furnaces and by product or beehive coke ovens are also included in this industry. Establishments primarily engaged in manufacturing ferro and nonferrous additive alloys by electrometallurgical processes are classified in Industry 3313.

RAILROAD SYSTEM*

Standard Transportation Commodity Code	Industry and Article Description
3300.000	Primary Metal Products
3310.000	Primary Iron and Steel Products
3312.000	Blast Furnace Products
3312.101	Carbon, Gas, Coke
3312.102	I/S Flue Dust
3312.103	I/ Mill Cinder and Scrap
3312.110	Pig Iron
3312.201	I/S Billets, Copper Clad
3312.202	I/S Billets, except Copper Clad
3312.211	I/S Slabs in the Rough
3312.999	*Reserved for summarizing data on commodities not significant for the purposes of a particular list or report; maintains control balance.

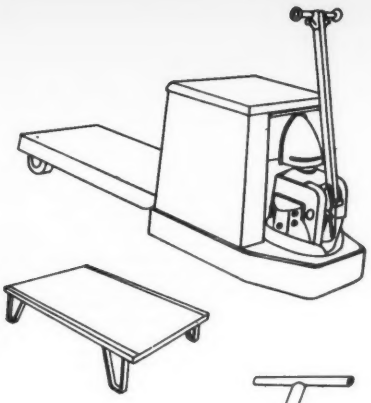
* **Note:** Railroad system was developed as an example of 7-digit system rather than as an actual working code, hence discrepancies from Budget Bureau system which was actually developed after the railroad system.

BUDGET BUREAU CODING SYSTEM

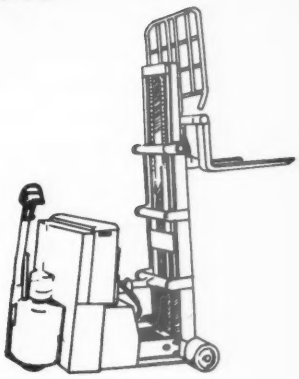
33	**PRIMARY METAL PRODUCTS**
331	Steel Works and Rolling Mill Products
3312	Primary iron and steel products and basic shapes
331201	Bars, except reinforcement bars: iron and and steel
331202	Billets, iron and steel
331203	Coke: carbon, gas
331204	Flue dust
331205	Mill cinder, or mill scale
331206	Pig iron
331207	Plate, armor: iron and steel
331208	Poles, electric wire: iron and steel
331211	Railway rails, iron and steel
331212	Reinforcement bars and rods, iron and steel
331213	Rings, iron and steel: rough
331214	Roofing, steel
331215	Sheet, iron and steel
331216	Skelp, iron and steel
331217	Slabs, iron and steel: rough
331218	Strip, steel
331221	Terneplate or tinplate, iron and steel
331222	Tie plate and tie rods, railway track
331223	Tubes and tubing, iron and steel
331290	Primary iron and steel products and basic shapes, not elsewhere classified

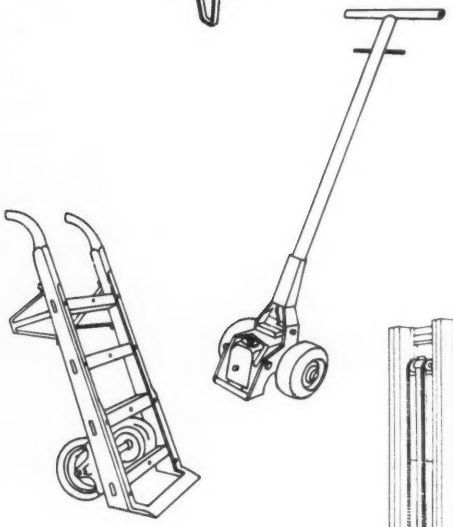
NOTE: That both individuals and companies, as taxpayers, have a stake in simplifying the entire commodity-based rate-making structure, whether by data processing or other means, is suggested by these figures obtained in mid-November from the Interstate Commerce Commission:

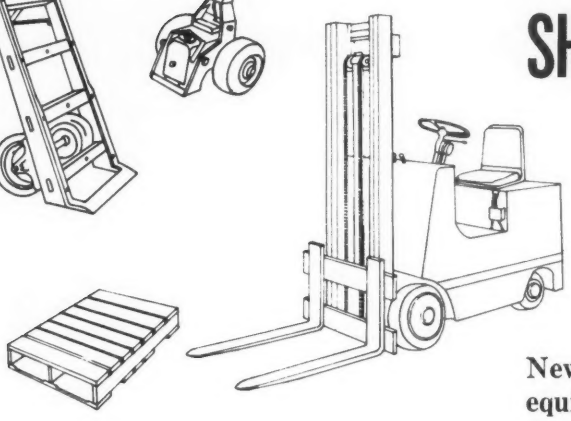
- **There are at present 204,275 active tariffs in the public files of the ICC.**
- **These tariffs contain from 1 to 1500 separate rates.**
- **There are more than 800,000 pages of tariffs filed each year.**
- **Active tariffs in the ICC public files occupy 5,366 linear feet and 4,480 cubic feet; the ICC official file of active tariffs occupies 4,100 cubic feet.**
- **These tariffs figure in most of the 20,000 cases handled by the ICC each year.**

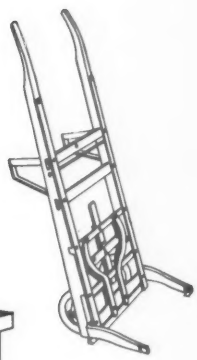


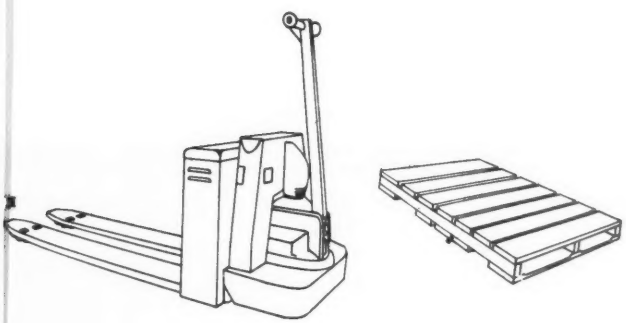
HOW TO CHECK COSTS OF HANDLING & STORING NON-UNITIZED SHIPMENTS

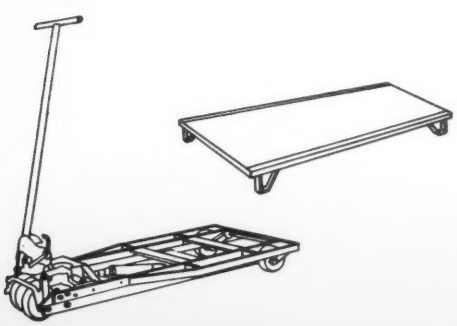












New USDA study relates costs of labor, equipment and storage space for seven different handling systems used on warehouse receiving docks, includes standard cost figures on basic handling equipment units.

Measurement of the tradeoff among costs for labor, equipment and warehouse space is the basis for a new study by the U. S. Department of Agriculture which provides some useful comparison figures for such basic handling equipment as hand trucks, jacks used with semilive skids, low-lift platform trucks, electric fork lift trucks and electric high-lift pallet transporters.

Industrial engineers Robert K. Bogardus and Richard T. Ferris studied the use of handling equipment under commercial operating conditions in independently located warehouses operated by wholesale

distributors of fruits and vegetables, and developed cost figures which, according to Mr. Bogardus, are generally representative of handling costs under most industrial and commercial conditions. He points out, however, that determination of the "expected useful life" of equipment in arriving at total costs can present some problems, since under today's rapidly-moving conditions, much handling equipment becomes obsolete before it actually wears out.

Another factor which should be borne in mind, he says, is that limited floor load capacities of some of the older warehouses studied prevented effective application of the optimum formula of equipment plus labor force plus stacking arrangement.

Tables 1 and 2 illustrate the method of arriving at cost figures for warehouse space on a square foot basis and for the storage space required for different methods of handling and storing. Table 3 shows the relative costs per ton (generally consisting of 50 40-lb. packages) of different combinations of the basic handling and storage methods. Tables 4 and 5 show the costs of owning and operating the different units of equipment involved in these basic systems.

The equipment cost figures are based on 2000 hours of operation yearly, or approximately 8 hours a day, 5 days a week. If equipment is used on two shifts (as it actually was in some of the cases studied), cost-per-hour figures would be cut in half.

TABLE 1. *Cost to own and maintain a warehouse facility with an initial cost of $10 per square foot* and an expected life of 30 years.*

Cost item	Cost per square foot
Annual cost:	
Depreciation †	$.33
Average interest at 5 per cent	.25
Insurance and taxes at 4 per cent	.40
Maintenance at 1 per cent	.10
Total annual cost	1.08
Daily cost (365 days)	.0030
Cost per average storage period (4½ days)	.0135

* *Based on experience of members of United Fresh Fruit and Vegetable Association.*
† *Straight line depreciation.*

TABLE 2. *Floor area requirements and cost, to store 1 ton* of fruits and vegetables, for specified equipment types and storage methods.*

Equipment type	Storage Method	Area required (sq. ft.)	Cost†
2-wheel handtruck	Hand-stack	14	$.19
Semilive skid, 36- by 54-inch	Hand-stack	16	.22
2-wheel handtruck	Tip off	19	.26
Pallet, 48- by 40-inch	On pallet partial tiering	23	.31
Semilive or dead skid, 36- by 54-inch	On skid	27	.36
Pallet, 48- by 40-inch	On pallet, no tiering	29	.39

* *Generally in 40-lb. cartons.*
† *The equivalent cost per square foot is $0.0135.*

TABLE 3. *Labor, equipment and storage space costs for receiving and storing 1 ton* of produce with specified types of materials-handling equipment and methods.*

EQUIPMENT	STORAGE METHOD	CREW SIZE	ELAPSED TIME (HOURS)	LABOR COST	EQUIPMENT COST	STORAGE SPACE COST	TOTAL COST
2-wheel handtruck or clamp trucks	Hand-stacked	4	.108	$.86	$.01	$.19	$1.06
Semilive skids and jack	Hand-stacked	3	.108	.65	.01	.22	.88
Semilive skids and jack	Stored on skids	2	.101	.40	.07	.36	.83
2-wheel clamp trucks	Release load intact	3	.092	.55	.01	.26	.82
2-wheel handtrucks	Tip off load intact	3	.089	.53	.01	.26	.80
Dead skids and electric low-lift platform truck	Stored on skids	2	.098	.39	.04	.36	.79
Pallets and electric forklift truck	Stored on pallets, partial tiering	3	.068	.42	.05	.31	.78
Pallets and electric high-lift transporter	Stored on pallets, partial tiering	3	.068	.42	.04	.31	.77

* *Generally in 40-lb. cartons.*

TABLE 4. *Ownership and operation costs for 1 unit each of various types of materials-handling equipment. Cost per hour is based on 2,000 hours of use each year.*

Equipment	Initial cost per unit	Expected useful life (years)	OWNERSHIP COSTS: Depreciation	Average interest at 5 per cent	Insurance and taxes at 4 per cent	Total	OPERATION COSTS: Power	Maintenance	Total	Total annual cost	COST PER HOUR
Bridge plates (steel):											
For rail car	$ 225.00	10	$ 22.50	$ 6.19	$ 9.00	$ 37.69		$ 5.00	$ 5.00	$ 42.69	$.0213
For truck	106.00	10	10.60	2.92	4.24	17.76		5.00	5.00	22.76	.0114
2-wheel handtruck (1,000-pound capacity, rubber tired wheels)	40.00	12	3.34	1.08	1.60	6.02		4.00	4.00	10.02	.0050
2-wheel clamp truck (1,000-pound capacity)	90.00	12	7.50	2.44	3.60	13.54		12.00	12.00	25.54	.0128
Jack-lift for semilive (3,000-pound capacity)	70.00	12	5.84	1.90	2.80	10.54		12.00	12.00	22.54	.0113
Semilive skid (2,000-pound capacity 36- by 54-inch)	35.00	12	2.92	.94	1.40	5.26		10.00	10.00	15.26	.0076
Industrial fork-lift truck (2,000-pound capacity, 106-inch lift):											
Machine	4,900.00	8	612.50	137.82							
2 batteries (14.85 kilo-watt-hour capacity)	2,500.00	5	500.00	75.00							
Charger	1,150.00	8	143.76	32.34							
Total	8,550.00		1,256.26	245.16	342.00	1,843.42	$151.14	270.00	421.14	2,264.56	11.323
Industrial high-lift pallet transporter (2,000-pound capacity, 100-inch lift):											
Machine	3,000.00	8	375.00	84.38							
2 batteries (6.3 kilo-watt-hour capacity)	1,340.00	5	268.00	40.20							
Charger	491.40	8	61.42	13.82							
Total	4,831.40		704.42	138.40	193.26	1,036.08	53.80	160.00	213.80	1,249.88	.6249
Industrial low-lift pallet transporter (4,000-pound capacity):											
Machine	1,650.00	8	206.24	46.40							
2 batteries (4.15 kilo-watt-hour capacity)	810.00	5	162.00	24.30							
Charger	450.00	8	56.24	12.66							
Total	2,910.00		424.48	83.36	116.40	624.24	17.08	160.00	177.08	801.32	.4007
Industrial low-lift platform truck, electric (4,000 pound capacity):											
Machine	1,470.00	8	183.74	41.34							
2 batteries (4.15 kilo-watt-hour capacity)	810.00	5	162.00	24.30							
Charger	450.00	8	56.24	12.66							
Total	2,730.00		401.98	78.30	109.20	589.48	17.08	160.00	177.08	766.56	.3833
Mechanical (4,000-pound capacity	330.00	12	27.50	8.94	13.20	49.64		16.00	16.00	65.64	.0328
Hydraulic (4,000-pound capacity	362.50	12	30.20	9.82	14.50	54.52		16.00	16.00	70.52	.0353
Pallet dollies:											
For rail car	159.00	10	15.90	4.37	6.36	26.63		5.00	5.00	31.63	.0158
For truck	51.00	10	5.10	1.40	2.04	8.54		5.00	5.00	13.54	.0067

TABLE 5. *Ownership and operation costs of 1 unit each of pallets, dead skids, and semilive skids. Cost per use is based on 80 uses per year.*

Equipment	Initial cost per unit	Expected useful life (years)	OWNERSHIP COSTS: Depreciation	Average interest at 5 per cent	Insurance and taxes at 4 per cent	Total	OPERATION COSTS: Power	Maintenance	Total	Total annual cost	COST PER USE
Pallets (40- by 48-inch)	$ 3.00	6	$ .50	$.08	$ .12	$ .70		$1.00	$1.00	$1.70	$.0213
Dead skids (36- by 54-inch)	12.00	13	.92	.32	.48	1.72		.24	.24	1.96	.0245
Semilive skids (36- by 54-inch)	35.00	20	1.76	.92	1.40	4.08		5.00	5.00	9.08	.1135

Monorail system for one-man loading of 20′ long bundles of rolled steel channels

Free-swinging leg traverses 150° arc, solves difficult truckloading problem

A monorail system developed for the Versabar Corp. of Jersey City permits one-man handling and loading of 1000-lb. bundles of rolled steel channels which had previously required three men working with an overhead three-motor bridge crane. Although the old system worked well enough for open-top trailers or trucks, it was difficult and risky for conventional closed tops which were often the only types available, because the bundle had to be placed half-way into the truck and then held there by the three men while the sling was slipped back and the crane advanced. Stacking bundles two or three deep in trailers presented even greater problems.

Under the new system, one man is able to pick up a bundle of any of the 40 types of channel carried in stock and deposit it directly in a conventional trailer without rehandling. The system also serves the saw and is used for loading inbound materials. Woven steel slings are used for the channel bundles and nylon slings for fittings and hardware packed in corrugated cartons. The company reports that costs have been cut and loading time reduced substantially. Truck drivers, who formerly were backed up in the street waiting their turn, have praised the system for its speed and ease of operation.

The system was developed by M-H Standard Corp., which says that it can be furnished to suit individual space requirements for handling and loading long bundles of steel, lumber, rolls or other items.

HOW THE SYSTEM WORKS: The system consists of an L-shaped monorail, with one leg fixed and the other leg actually a hinged boom, supported about 14′ from its free end by a trolley rolling on a curved rail which permits it to traverse an arc of about 150° and thus reach most areas on the warehouse floor not served by the fixed leg. A 1000-lb. cable hoist with a motor-driven trolley serves both the fixed and free-swinging (boom) sections of the monorail system. In the photographs, workman picks up bundle from storage rack (A), traverses boom over packing area into position for truck-loading (B), and deposits bundle after truck has backed in (C). Note that all loading operations are handled from the floor, with truck actually inside the warehouse. If bundles are picked from forward storage area served by boom, boom must be positioned before truck can be backed into position for loading, while if they are picked from the rear area served by the fixed monorail, boom can be positioned and truck backed in before bundle is picked. (For additional information, circle No. 200, Distribution Data Card.)

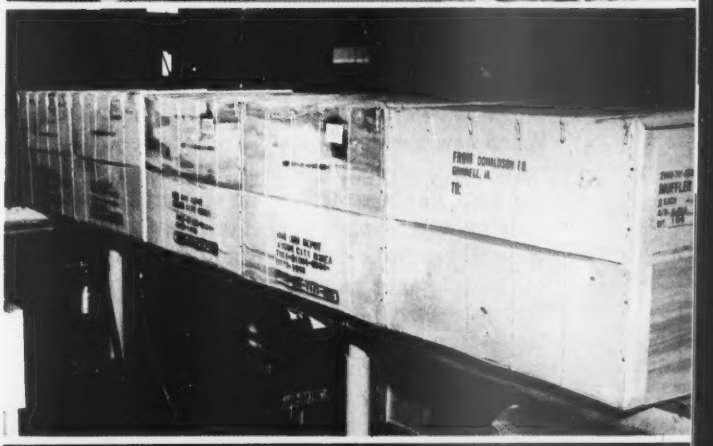
an L-
other
t 14′
rved
bout
ouse
cable
n the
f the
kman
erses
ruck-
k has
tions
ually
from
must
into
icked
orail,
n be-
rma-
d.)

PACKAGING SWITCH: *Corrugated containers for high-density product; wirebound for low-density item*

Corrugated masterpacks for metallic shot and grit which weigh in when loaded at 2000 lbs., and wirebound masterpacks for truck muffler assemblies with a loaded shipping weight of 164 lbs. demonstrate the fact that the product doesn't always determine the package.

In the case of National Metal Abrasive Co., Cleveland, a corrugated pallet pack masterpack containing 40 50-lb. containers was developed (by Hankins Container Co.) to handle the same volume of shot and grit formerly shipped in 20 100-lb. bags. The traditional 100-lb. burlap bags presented breakage problems, but their primary drawback was in the time consumed for loading and unloading — taking two husky workmen half a day to unload one truckload. With the new method, one operator with a fork lift can unload a truck or box car in less than half an hour, the company says.

The corrugated pallet packs can be stacked 3 high for shipment, 4 high for storage, and the 50-lb. individual units can be handled singly by one man. A recent development has been to use white board for the masterpack, with descriptive and advertising material prominently overprinted, making the functional package stand out in the often dark and dusty interiors of foundries where the product is used.



Advantage claimed for the wirebound masterpack system is that it results in important economies in truck- and car-loading and in unloading, handling, storing and reshipment, as well as affording adequate protection during shipment and handling under a variety of conditions.

Wirebound boxes illustrated here are a product of the Flour City Box Mfg. Co., Inc.

Protective, stacking features of wirebound containers cited in military application

The Donaldson Co., Grinnell, Ia., produces truck muffler assemblies which are shipped to the Army's Anniston Ordnance Depot in Alabama and reshipped from there to overseas installations. The mufflers are carried by conveyor directly from final assembly to the packing area where they are packed individually in WC-6 waterproof fiberboard cartons and then sealed. Six cartons are then consolidated into one package by being packed into a wirebound master container.

The wirebound units are shipped by rail and truck to Anniston, where they are placed two on a pallet and stacked 5 high, or as high as ceiling and handling equipment permit. Total shipping weight of each wirebound unit is 164 lbs.

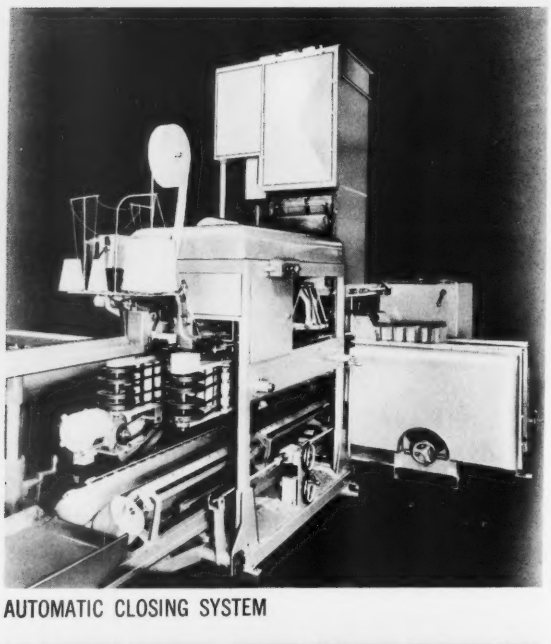
Packaging/Packing & Shipping Room Ideas

A MONTHLY REVIEW

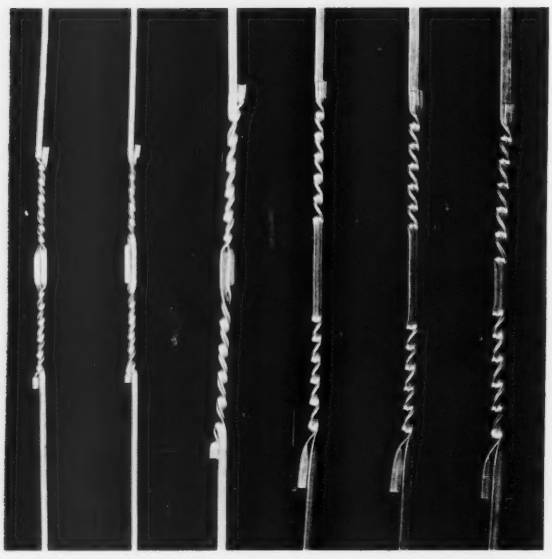
When new packaging ideas are rejected, why not make a list of the reasons? Sometimes it develops that new containers, new cushioning materials or new systems meet all but a very few critical conditions — conditions which are apt to be changed almost overnight by breakthroughs in handling, transportation or even in the design of the products you ship. When proposed ideas are turned down because they would result in an increase in the invoice cost of packaging materials, it can be particularly useful to keep track of developments in other phases of the distribution cycle which can bring the overall cost down.

One company, for instance, made a number of stabs at adopting a new packaging technique which produced substantially increased costs . . . at first. On the fourth go-round, the company discovered that increased volume and changed selling conditions of their products, plus improved handling methods, would make the new technique pay off in spades. Point to remember is that materials prices may fluctuate wildly — corrugated containers as much as 10 per cent in a given year — but engineered changes which produce savings of 10, 20 or even 100 per cent can be made more or less permanent because they are within your control. If packaging costs are kept in isolation, or if the factors that ruled out a packaging innovation at a certain time are forgotten, some really worthwhile savings may be bypassed.

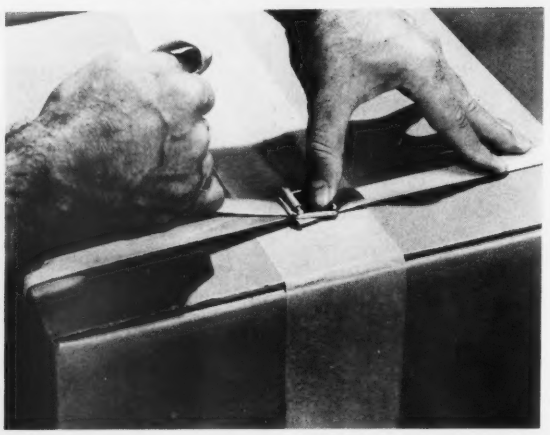
(For additional information about these recently announced items, circle the key number on the "Distribution Data" postage-paid card in this issue.)



AUTOMATIC CLOSING SYSTEM



FLATTENED WIRE STRAPPING

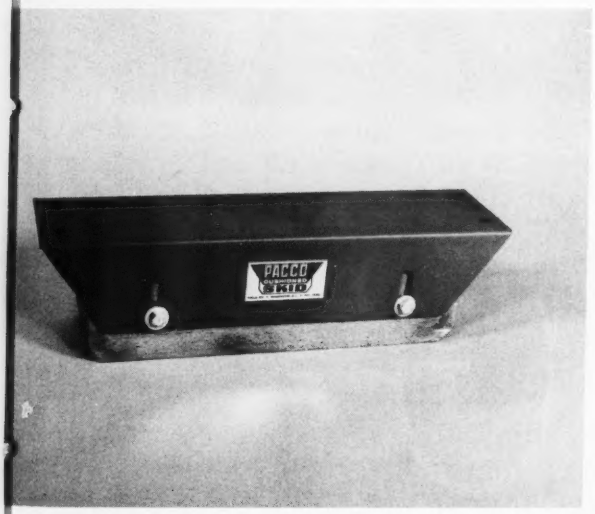


NON-METAL STRAPPING

Packaging/Packing & Shipping Room Ideas

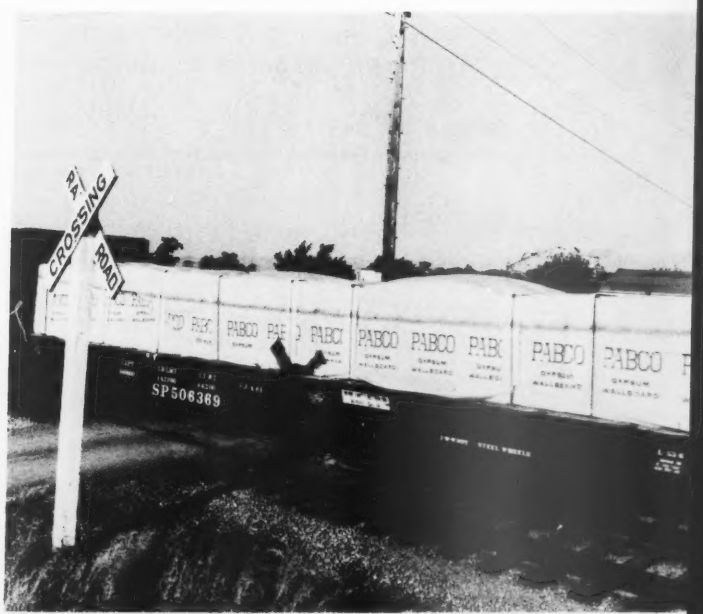
A MONTHLY REVIEW

New non-metal strapping, Tex-Strap, has been introduced by Texlon Corp., is made of synthetic twisted type filament bonded to kraft backing. Strapping comes in 3 widths, which can all be handled by same set of tools for tensioning and crimping. Material can be used with metal buckles (illustrated), eliminating need for tools in fastening (No. 207). **Automatic filling and closing system** for multiwall bags has been developed by Bemis Bro. Bag Co. Combining the company's automatic filler-scale, bag feeder and conveyor with a newly-devised automatic closing machine, the system is capable of filling and closing up to 20 bags (2,000 lbs.) of most applicable products per minute. It requires no operator, says the company, merely a part-time attendant to periodically fill the 400-bag capacity automatic feeder, and the new automatic closing unit performs the work of one or two operators in current manual systems (No. 208). **Flattened, galvanized wire** for strapping operations is said by manufacturer to save up to 30 per cent in material costs over ¾" steel strapping and to also show favorable cost reductions against other sizes of flat band strapping. Specifications of its Ribbostrap give it an equal tensile strength per foot at a much lighter weight than flat band steel strapping, says Strapping Materials Co., and strength of the joint eliminates need for joint



CUSHIONED SKID

seals and speeds up strapping operations (No. 209). **Polyethylene tarpaulins** which protect products in transit and serve as "traveling billboards" are manufactured to specifications by Gering Plastics Div. of Studebaker-Packard. Company says tarps permit reduction of handling costs by permitting shipping in flat cars or flat bed trucks, are available in variety of color combinations. In application illustrated, lettering is vivid red on brilliant yellow background (No. 210). **Cushioned skid** for attachment to exterior of crates or containers as alternative to interior shock-isolation systems has been developed by Packaging & Converting Co., comes in 15 standard sizes suitable for protecting loads from 100 to 3,000 lbs. Each skid contains cushioning pad of polystyrene foam, precompressed to minimize drift and thickness loss. Company says use of skids can result in substantial savings in cost, weight and cubage, will provide "excellent protection" against shock in transportation and handling (No. 211).



POLYETHYLENE TARPAULINS

DISTRIBUTION MANAGEMENT TIPS

(Continued from page 3)

the very reason that the basic reasons for expansion or site location will vary from case to case. Although the least-cost distribution point will often be the primary factor in all plant location activities of a given company, differences in product lines, market composition and selling methods suggest that a standard weighted rating scale taking all these differences into account would be both cumbersome and inaccurate.

This doesn't rule out the various sophisticated site selection procedures practiced by larger companies which have adequate manpower and computer services for the job. But it does mean that in the smaller company a great deal of the success in site selection will depend on how well one or a very few individuals apply their judgment to evaluating their company's needs — and its limitations, financial and otherwise — before they embark on the search. To start looking without a clear idea of what is needed (and what is *not* needed, too, like an excess of country clubs or a freakish tax situation which will undoubtedly be rectified as soon as there's an industry to tax), is to invite a decision governed by the attractive but often relatively unimportant features of the communities visited. Chambers of commerce, power companies and transportation agencies will understandably emphasize the strong points of given communities; if you are planning to import a team of 1000 scientists, for instance, it will obviously be important to locate in a community with suitable social, cultural and recreational activities. But if your rating scale has been properly set up in the first place, these needs will have been taken into account, and an abundance of suitable esthetic activities in a given community won't tend to obscure the fact that its transportation services are wholly inadequate to your needs or its water supply subject to dangerous seasonal declines.

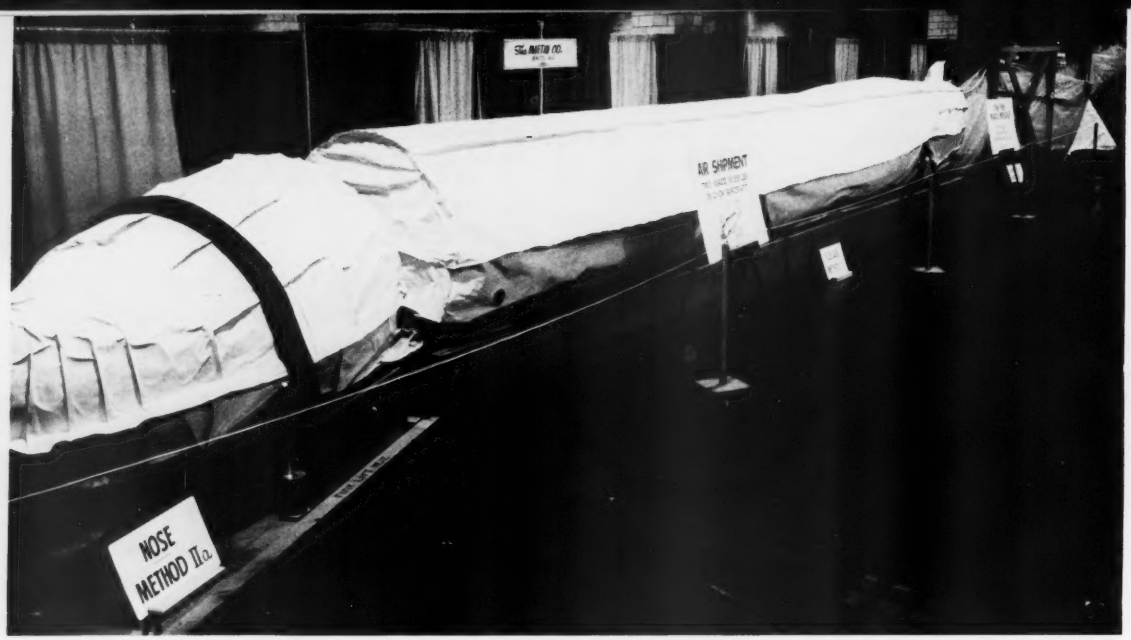
(Note: Summaries of the SBA report quoted above may be obtained from field offices or Washington headquarters of the Small Business Administration, Washington 25, D. C. Copies of the full report may be obtained free upon request from the West Virginia University Bureau of Business Research, Morgantown, W. Va.)

A Comprehensive review of the unit load principle

The unit load — containerization, piggyback, fishyback and birdyback, as well as pallets and skids, self-locking loads and strapped, glued and wired loads — will be covered in a comprehensive bibliography of current literature and research on the subject which will appear in T & D M early in 1962. For the third time in as many years, the Canadian National Railways has generously made available to The Traffic Service Corp., publishers of T & D M, the results of its carefully executed and extensive research in this important area of physical distribution. Prepared under the direction of CNR Senior Work Analyst Charles Bryan, the bibliography covers books, periodicals, professional journals, papers and leaflets published in the U. S., Canada, Europe and South America in the years 1960-61, plus a brief digest or review of each article or publication.

HIGHLIGHTS of the Eastern Packaging and Handling Show

2300-lb. car is supported by Tri-Wall corrugated container — with Acme Steel slotted angle guard just in case. Slotted angle uses for shipping crates were demonstrated at show, but guard frame shown here saw no action, as corrugated container withstood test. **(Tri-Wall Containers, No. 216 Distribution Data Card; Acme Steel slotted angle, No. 217).**



Military and defense exhibits stressed integrated packaging —handling systems, often demonstrated spectacular savings

SPHE Eastern Show (Cont.)

Sen. Philip A. Hart (D, Mich.) spoke to an overflow audience at the Package Engineering Seminar in Baltimore, held under the sponsorship of the Society of Packaging and Handling Engineers. His subject: Deceptive Labeling and Packaging Practices, a topic on which his frequent expressions of opinions have made him somewhat of a controversial figure in the industry.

Four panel discussions based on the theme of "accelerated product distribution in the space age" covered these subjects: the military build-up and government packaging; operational aspects of containerization; the science of package cushioning; flexible plastic foam packaging of tomorrow.

Held in conjunction with the seminar was the 1961 Packaging and Handling Competition and the 7th annual Eastern Packaging Show, held under the auspices of the Maryland chapter of SPHE. About 1700 persons ("All professionals — no women or children," according to SPHE officials) attended the show, which had strong military overtones in the form of its two feature displays, an Air Force Mace missile and a Navy Vanguard satellite.

Notable among the numerous military and defense exhibits at the SPHE Eastern Show was the "Mobilpac" system (above, right) developed by Lockheed Missiles and Space Co. for integrated protective packaging and handling of two major spacecraft segments, the nose cone and booster adapter.

Basically, the system consists of dollies constructed from lightweight aluminum tubing and plywood cradles designed to hold a part securely. Two of the dollies are joined together to form a rigid, lightweight shipping and storage container. The resulting caster arrangement, one at each of the four corners, makes it possible to push or tow the unit, loaded or unloaded, either in a vertical or a horizontal position.

The Mobilpac system, says Lockheed, was designed to afford protection "from cradle to grave," including phases of manufacturing, testing, shipping and storage.

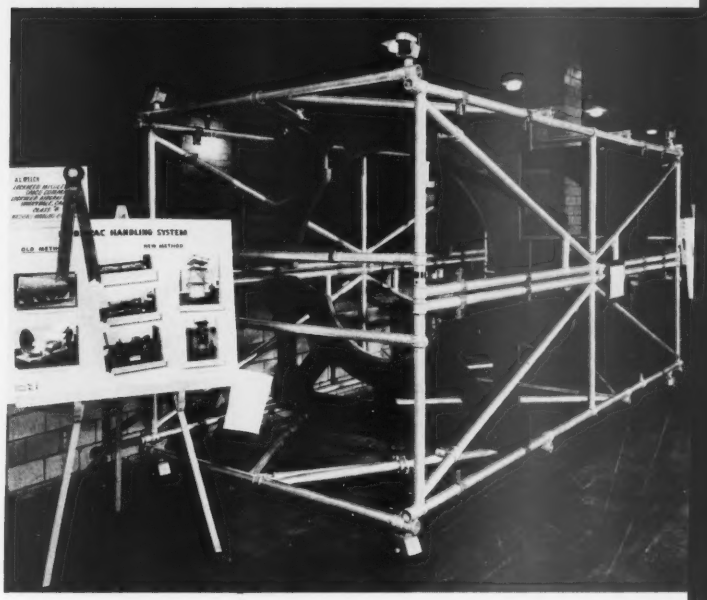
Martin Company's Mace missile, packaged for air shipment was feature of show. Exhibit showed alternative packaging methods. Navy Vanguard satellite was also shown.

It has already replaced several pieces of equipment formerly used in these phases, such as inter-plant dollies, fabrication fixtures, sheath crates and transport carriers. Both old and new systems afford complete damage protection. By eliminating the necessity for certain specialized pieces of handling equipment at the plant, similar advantages are generated for the receiver in that the shipment arrives with its own built-in ground handling equipment.

Cost savings quoted on the Lockheed system are spectacular: a total dollar saving of $11,209.26 for two spacecraft segments, a figure including materials, labor, transportation and storage utilization. With an anticipated use factor of 100 for these two segments, the annual saving would be $1.1 million. Even eliminating the cube utilization savings of $2,340 as possibly representing in some cases a theoretical rather than a cash savings, weight reduction and simplicity of assembly and handling show savings of $2,203 in transportation charges and $257 in labor costs. Although a comparison of cost of the Mobilpac unit itself with various elements of the previous system shows a savings of $6,109, it is not known whether some of those elements may have had other uses in intra- or inter-plant handling, a factor which would reduce the over-all savings to some degree.

Lockheed cites these additional features of the Mobilpac system: assembly-disassembly by one unskilled laborer without tools in less than 5 minutes; cube reduction of 87 per cent when being returned for re-use; adaption to accept a variety of sizes and shapes with minimum modifications; interchangeable, off-the-shelf parts; minimum weight (140 lbs.) and stacking features to increase space utilization.

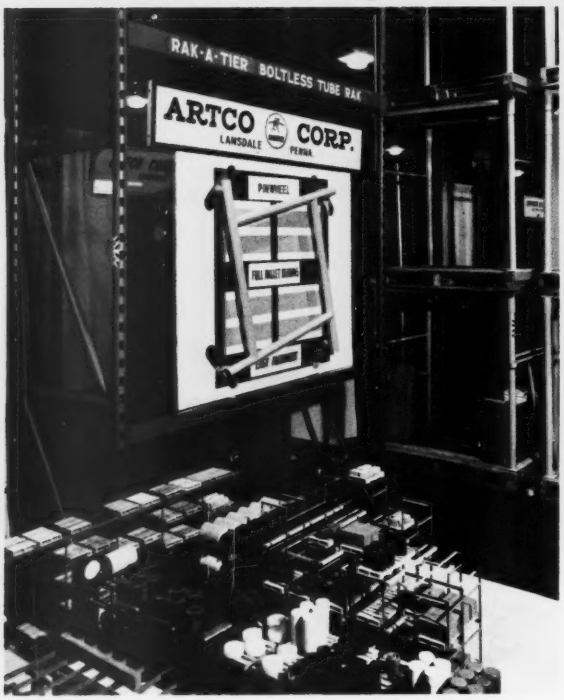
Manufacturer of the Mobilpac system is Engineered Export Services **(For additional information, No. 215 on Distribution Data Card).**



"Mobilpac" integrated packaging-handling system developed by Lockheed was prize-winner, offering substantial cost savings in labor, transportation and handling (see text).

Also a prize-winner was reusable shipping container for radar chronograph set, developed at Frankford Arsenal of Army Ordnance. Unit has internal cushioning, is water- and vapor-proof, 60 per cent lighter than comparable aluminum case and designed for manual or mechanical handling.

Pallet racks, bag sealers, nailers . . . even a coffee machine!



Artco Corp. display featured Rak-A-Tier boltless pallet rack system, showed specialized racks for bulk storage, drums and standard skids. **(No. 218, Distribution Data Card)**

Bag packager manufactured by Errich International Corp. is adaptable to polyethylene, kraft, will cut labor costs to 80 per cent, says company. **(No. 219, Distribution Data Card)**

SPHE Eastern Show (Cont.)

Powasert automatic nailer weighs less than 10 lbs., has automatic feed and performs single blow nailing at speeds up to 120 per minute. **(No. 220, Distribution Data Card)**

Coffee-maker brews each cup individually, is suggested for remote locations in plants, warehouses because of ease of servicing. **(No. 221, Distribution Data Card)**

DISTRIBUTION DATA to send for

(000) Circle this number on business reply card — help us and advertisers by only requesting information you are interested in and can use! **See other side of card for new products, literature, and services and products of advertisers.**

CASE HISTORIES & APPLICATIONS

MATERIAL HANDLING CASE HISTORIES

178 *Lewis-Shepard:* Step-by-step integration of material handling equipment into warehousing, in-process and finished goods palletized program at Holtite Mfg. Co., successfully pursued over 10 year period in contrast to "accepted" methods of installing complete material handling system at one time.

179 *Automatic Transportation Co.:* Unloading of bar stock from trucks cut 80% — from one day or more to 1½ hours for a typical load — at Fisher Governor Co., through use of electric platform truck with simple boom and tong attachments.

180 *Mechanical Handling Systems, Inc.:* "Selec-Tow-Line" conveyor system at Philadelphia Wholesale Drug Co. warehouse has 13 spur tracks to which tow carts may be prerouted by setting indicator on carts. System also has 3 spurs for trash carts.

181 *Hyster Co.:* 7,000-lb. capacity lift truck used to unload box cars and stack in 12' aisles at United States Plywood Corp. warehouse. Free-lift upright permits raising forks above load in car for maneuvering, while fork extensions are used for end-loading.

182 *Cushman Motors:* Conversion of utility vehicles into vehicles for towing flatbed trailers used in warehouse order-filling at Skaggs-Stone Co. to replace fork lift trucks formerly used effects "considerable" expense reduction in initial cost and maintenance.

183 *Towmotor Corp.:* Movement of bales of paper pulp from receiving docks to production area, and transportation and storage of 2000-lb. paper rolls, at Scott Paper Co., handled by two fork lift trucks, one with standard forks and one with ram attachment.

PACKAGING/PACKING SHIPPING ROOM

184 *Penco Div., Alan Wood Steel Co.:* Storing merchandise on adjustable steel shelving saves floor space, speeds order handling, reduces stock damage and improves inventory control at 304,000 sq. ft. warehouse of a large retailer.

185 *Acme Steel Co.:* Unit loads of logs at Eagle Lake Sawmills require less pond storage space, facilitate pond boat handling and eliminate losses from sinkers.

186 *Evans Products Co.:* "How to . . ." booklet for loading foremen illustrates various types of loads which can be accommodated with DF equipment, shows methods best designed to contain them. Typical loads illustrated: combination load of metal buckets and cartons; large drums; enamel stoves and refrigerators; tin plate or coiled steel.

187 *Fastener Corp.:* Use of "Duo Fast" staple nailers for industrial crating, expendable skid assembly and box car upgrading are applications illustrated in brochure.

188 *AVCO Corp.:* Performance test data reveals that company's bulk frozen food container can hold foods loaded at –5° below the allowable 0°F for periods of 24 hours or more in 100° summer heat without mechanical refrigeration or dry ice.

189 *Fairbanks, Morse & Co.:* Truck unloading and storage conveyor system at Folger Coffee plant incorporates platform scale that weighs up to 4 tons by one-lb. increments, has roll-fed weight printer.

190 *M-H Equipment Co.:* Cargo container designed to consolidate and speed handling of LTL freight is reported by truck line users to produce savings that pay the cost of the equipment often within days by eliminating 2, 4 or all 6 of the handlings normally required in an LTL shipment.

191 *American Viscose Corp.:* Use of firm's "Avistrap" rayon cord strapping in baling of grey goods by cotton textile manufacturers. "Selta Method" of baling described.

LITERATURE

192 *Overhead handling* in 16 different applications is illustrated in brochure, "Problem solvers at your fingertips," available from Manning, Maxwell & Moore, Inc.

193 *Standard storage systems* are itemized in an 8-pg. catalog from Bernard Gloekler North East Co. which lists 20 standardized steel upright frame units, each in 7 standard widths and with capacities up to 25,000 lbs.

PLEASE SEND MORE INFORMATION ABOUT—

CASE HISTORIES & APPLICATIONS			PRODUCTS DESCRIBED EDITORIALLY		
178	186	194	200	208	216
179	187	195	201	209	217
180	188	196	202	210	218
181	189	197	203	211	219
182	190	198	204	212	220
183	191	199	205	213	221
184	192		206	214	
185	193		207	215	

(This card good until January 31, 1962)

WE CANNOT SERVICE YOUR REQUEST UNLESS THE FOLLOWING INFORMATION IS COMPLETE!

Name.....Title.....

Company.....Products.....

Address.....City.....Zone.....State.....

☐ *Please check here if you are not receiving your personal copy of T & D M and would like to receive it regularly, free of charge.*

FIRST CLASS
PERMIT NO. 5281-R
WASHINGTON, D.C.

BUSINESS REPLY MAIL

NO POSTAGE STAMP NECESSARY IF MAILED IN UNITED STATES

T&DM

815 WASHINGTON BUILDING
WASHINGTON 5, D.C.

DISTRIBUTION DATA to send for

(000) Circle this number on business reply card—help us and advertisers by only requesting information you are interested in and can use! **See other side for case history and application material to send for.**

NEW PRODUCTS AND SERVICES—INFORMATION FROM ADVERTISERS

194 *Drop front tariff files* available in sections are described in literature from P. A. Wetzel & Son.

195 *Cargo control system* for trucks and trailers which utilizes strapping and/or rigid cross members is illustrated in Aeroquip Corp.'s Bulletin 664.

196 *Pressure-sensitive tapes* in various uses are illustrated in 44-page booklet offered by Mystik Adhesive Products, Inc.

197 *Addressing multiple shipments* as a byproduct of office procedure is subject of brochure from Sten-C-Label, Inc. showing step-by-step application of its system.

198 *Integrated data processing* systems for order-writing, invoicing and production scheduling, as well as data retrieval, are described and illustrated in 32-pg. booklet from Friden, Inc.

199 *7 new lift truck models* are illustrated in 24-pg. catalog from Allis-Chalmers; engineering, construction and operating features are detailed.

PRODUCTS DESCRIBED EDITORIALLY

200 *Monorail truckloading system* for bundled rolled steel channels (M-H Standard Corp., page 24).

MATERIAL HANDLING IDEAS, pg. 37

201 *Product handling system* can load trailer with prepalletized items in 3 minutes (Kappen Sales Co.).

202 *Top handling of folded cap cartons* with new fork lift attachment (Basiloid Products Corp.).

203 *Economical overhead conveyor* eliminates conventional I-beam construction, permits sharp turns (Hapman Co.).

204 *Paper roll and drum handler* handles cylindrical objects up to 36" in diameter (Big Joe Mfg. Co.).

205 *Door opening switch* activated by vehicular or pedestrian traffic (Ronan & Kunzl).

206 *Lift truck for rug handling* is said to have "amazing" maneuverability (Lectro-Lift).

PACKAGING/PACKING, SHIPPING ROOM IDEAS, pg. 28

207 *New non-metal strapping* comes in 3 widths, can be crimped or buckled (Texlon Corp.).

208 *Automatic filling and closing system* for multiwall bags fills and closes 20 100-lb. bags per minute (Bemis Bro. Bag Co.).

209 *Flattened, galvanized wire* for strapping operations saves up to 30%, says manufacturer (Strapping Materials Co.).

210 *Printed polyethylene tarpaulins* protect products in transit, serve as "traveling billboards" (Gering Plastics Div., Studebaker Packard).

211 *Cushioned skid* as alternative to interior shock-isolation systems comes in 15 sizes (Packaging & Converting Co.).

INDUSTRY BRIEFS, pg. 18

212 *Appraisal of material handling industry* in monthly publication of stock brokerage firm (Francis I. duPont & Co.).

213 *9-part bill of lading*, "Verifax Interline Procedure," permits shipper, carriers and consignee to use identical documentation based on shipper's original writing (Eastman Kodak Co.).

214 *Facsimile billing system*, "Clipperfax," reproduces shipper's bill of lading on left hand side of freight bill with weights and rates extended by computer (Clipper Carloading Co.).

EASTERN PACKAGING-HANDLING SHOW, pgs. 31-34

215 *Mobilpac system* for integrated protective packaging and handling of spacecraft segments (Engineered Export Services).

216 *Heavy-duty corrugated container* supports 2300-lb. car (Tri-Wall Containers, Inc.).

217 *Slotted angle* for use in construction of shipping crates (Acme Steel).

218 *Boltless pallet rack system* with "pinwheel" construction (Artco Corp.)

219 *Bag packager* said to cut labor costs up to 80% (Errich International Corp.).

220 *Automatic nailer* weighs less than 10 lbs. (United Shoe Machinery Corp.).

221 *Coffee-maker* brews each cup individually (Rudd-Melikian, Inc.).

FIRST CLASS
PERMIT NO. 5281-R
WASHINGTON, D.C.

BUSINESS REPLY MAIL

NO POSTAGE STAMP NECESSARY IF MAILED IN UNITED STATES

T&DM
815 WASHINGTON BUILDING
WASHINGTON 5, D.C.

PLEASE SEND MORE INFORMATION ABOUT—

CASE HISTORIES & APPLICATIONS			PRODUCTS DESCRIBED EDITORIALLY		
178	186	194	200	208	216
179	187	195	201	209	217
180	188	196	202	210	218
181	189	197	203	211	219
182	190	198	204	212	220
183	191	199	205	213	221
184	192		206	214	
185	193		207	215	

(This card good until January 31, 1962)

WE CANNOT SERVICE YOUR REQUEST UNLESS THE FOLLOWING INFORMATION IS COMPLETE!

Name.....Title.....

Company.....Products.....

Address.....City.....Zone.....State.....

☐ *Please check here if you are not receiving your personal copy of T & D M and would like to receive it regularly, free of charge.*

Material Handling IDEAS

NEW EQUIPMENT
NEW INSTALLATIONS
NEW APPLICATIONS
A MONTHLY REVIEW

How long should a lift truck work? In actual practice, you'll find the number of hours worked daily ranging all the way from an hour or so to a full three shifts, minus downtime for servicing. Considering the obsolescence factor, and the fact that costs of handling equipment are inexorably linked to such time factors as interest, insurance and overhead, it's natural to view potential hours of utilization as an important factor when selecting handling equipment. On the other hand, there are many cases where the total impact of a particular piece of handling equipment will justify the investment, even though the equipment itself may be in use as little as an hour and a half daily.

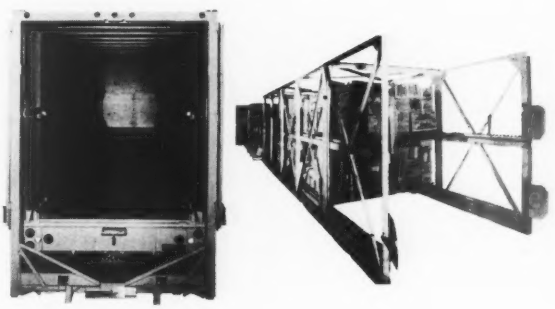
An important point to remember here is that even though one department may have exclusive use of the equipment, charging the equipment's cost entirely to that department may not give a true picture of its worth. For instance, if the equipment frees laborers who were formerly pulled off maintenance or manufacturing jobs for several hours daily, this fact should be taken into account, as should such items as space-saving through high-stacking, ability to handle larger inbound shipments with resulting transportation savings, and reduced downtime for loading and unloading production machinery.

In one company, investment in a fairly expensive lift truck was repaid in about eight months through savings in labor cost, although the truck itself is in use only about 20 per cent of the time and operates only in a limited area. In this particular case, a 7-man crew was cut to 4, the 3 men being reassigned to more productive work (presumably at the same rate of pay) and the 4 remaining men being enabled to take on additional work which had formerly been handled by other departments. Although it's sometimes difficult to follow such savings all the way down the line, they should certainly be considered before an equipment purchase is rejected merely because the equipment won't have full utilization.

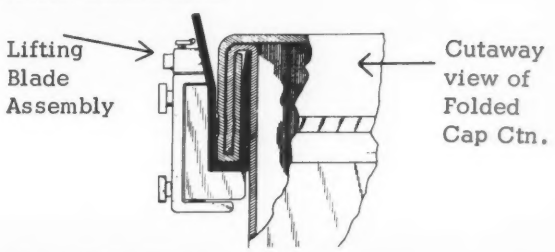
(For additional information about the following recently-announced items of material handling equipment, circle the key number, indicated in parentheses after each item, on the "Distribution Data" postage-paid card in this issue.)

Product handling system loads trailers in 3 minutes. The "Relae" system developed by Kappen Sales Co. permits pre-loading of pallets on a double-deck conveyorized rack which lines up with similar conveyor rails installed in the trailer body (see illustrations). When the trailer backs in, it is automatically positioned and leveled, and the pallets are rolled into position on the two levels. Company makes special pallet for system, but says that system has also been applied to merchandise hampers, cargo containers and product racks (No. 201).

"Top handling" of folded cap cartons is accomplished by a recently-developed fork lift attachment consisting of a lifting blade



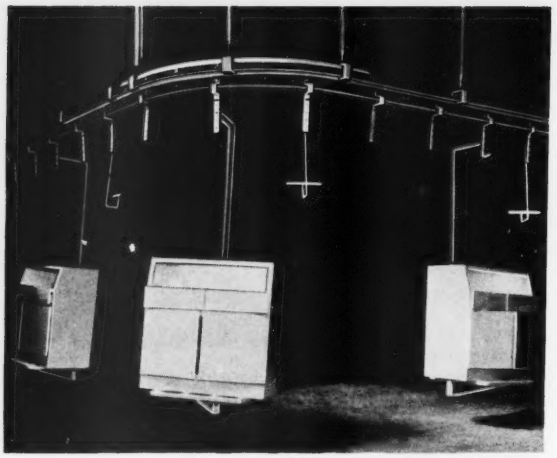
PRODUCT HANDLING SYSTEM



TOP HANDLING ATTACHMENT

which slides under the cap of the carton when the lift truck carriage is raised. Manufactured by Basiloid Products Corp., the attachment can be used with a single blade for narrow-aisle handling, or with double blades for wider aisles and larger volume. Cartons from 10″ to 76″ high can be handled, two at a time (one on top of the other) with the single blade, four at a time with the double blade (No. 202). **Economical overhead conveyor** is said by manufacturer, Hapman Co., to eliminate conventional I-beam construction entirely and to represent only truly new overhead conveyor design in more than 20 years. A double T-bar track arrangement permits sharp horizontal and vertical turns, and a variety of standard track sections permits formation of almost any desired shape or length conveyor path. Company claims several specific advantages over I-beam, cable, closed track and other kinds of conveyor systems (No. 203). **A new paper roll and drum handler** for its lift trucks and for adaptation on similar lift trucks has been announced by Big Joe Mfg. Co. The mechanical tilting device handles cylindrical objects up to 36″ in diameter, has large rubber pads to prevent product damage, and rotates a full 360° (No. 204.) **Door-opening switch** for permanent installation in paved drive or floor can be actuated by either vehicular or pedestrian traffic, is said by manufacturer to be not subject to damage usually encountered by surface mounted switches. Roman & Kunzl's "Trip Strip" is so designed that parts subject to wear can be replaced quickly without disturbing the floor or pavement. Low voltage electric contacts are sealed in and weatherproof (No. 205). **Lift truck for rug handling** has been introduced by Lectro-Lift, is built on 24″ load centers with 61″ overall length, less rug-handling ram, is said by manufacturer to have "amazing" maneuverability (No. 206).

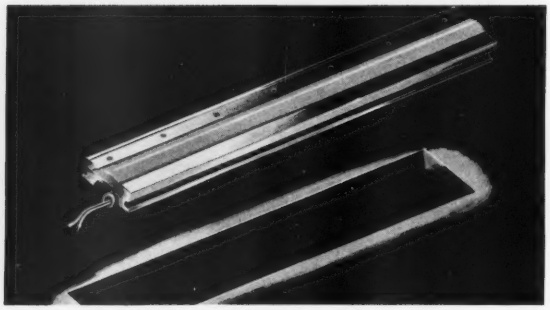
(For additional information about new developments in material handling equipment, turn to the Distribution Data Card)



ECONOMICAL OVERHEAD CONVEYOR

PAPER ROLL HANDLER

DOOR-OPENING SWITCH



RUG-HANDLING LIFT TRUCK

Announcing the publication of –

"Essays On Physical Distribution Management"

by Edward W. Smykay
Associate Professor of Business Administration
Michigan State University

Tremendous savings are possible through an analysis and application of physical distribution principles. An explanation of the methods to employ to realize these savings is presented by an outstanding authority on the subject. Dr. Smykay's book is oriented toward solving problems in areas of transportation, traffic management, inventory control, organization, plant location, cost analysis, research procedures, and the computer.

Contributions to this series of nine essays have been made by: Dr. Donald J. Bowersox, assistant director of business development, REA Express; Ross Jones, vice president – distribution, H. J. Heinz Co.; and Dr. E. G. Plowman, vice president – traffic, United States Steel Corp.

Copies may be obtained by writing the Book Dept., T&DM-Transportation & Distribution Management, 815 Washington Bldg., Washington 5, D. C. Price: $3.75 per copy, discounts quoted for quantities of 10 or more. Size: 100 pp., paper covers, illustrated with 35 diagrams, charts, tables.

Your warehouse on wheels!

Interstate System's comprehensive service can help you minimize inventories – safely!

■ Consider this. In America's industrial heartland, where more than 80% of the nation's productive capacity is concentrated, Interstate System moves more freight than any other motor carrier in the business. Service is swift, safe and dependable — direct, single-line, with one-carrier responsibility.

To you, this means effective inventory control. Inventories can be minimized safely; your investment in unproductive, costly storage space and stock reduced correspondingly; and your purchasing power will be freed-up for more effective, advantageous use. Savings can be significant. We're in the Yellow Pages.

Grand Rapids, Michigan
Canadian Offices: Toronto, Montreal

COMMON CARRIER REGULATED

INTERSTATE SYSTEM

MORE THAN A TRUCK LINE . . . A TRANSPORTATION SYSTEM

!

M

E M